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Project Manual

Bid Documents

SUCF PROJECT NO. 041046-00

PROJECT TITLE: Renovate Corey Union

DATE: November 16, 2026

SUNY CORTLAND

State University Construction Fund
State University Plaza
353 Broadway
Albany, New York 12246

"TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF, THE CONSTRUCTION DOCUMENTS FOR THIS PROJECT ARE IN CONFORMANCE WITH THE BUILDING CODE OF NEW YORK STATE AND ALL OTHER APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS, ALL AS CURRENTLY AMENDED"

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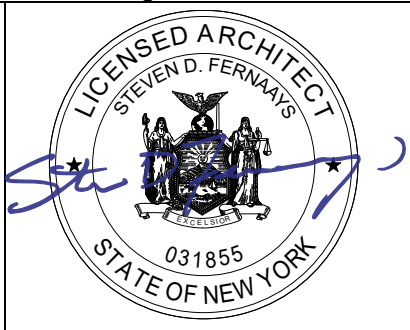
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1.1 DESIGN PROFESSIONALS OF RECORD

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(Refer to Section 2.12 of the Agreement regarding use of this information)

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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
   3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

A. Engineering Survey: Submit engineering survey of condition of building.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control, and for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Use of elevator and stairs.
   5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

D. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Submit before Work begins.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

F. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
   1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings.
   1. Inventory and record the condition of items to be removed and salvaged.
   2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
   1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
   2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
   3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
      a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
      c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
      d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
      e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
      f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
      g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
   2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4. Cover and protect furniture, furnishings, and equipment that have not been removed.
   5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. Do not use cutting torches.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   8. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to Owner's storage area on-site as designated by Owner.
   5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
   1. Remove existing roof membrane, flashings, copings, and roof accessories.
   2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

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SECTION 028213 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Refer to summary of previous survey documentation, prepared based on sampling reports. for information regarding materials that have been identified as asbestos-containing materials, materials found to contain “trace” asbestos and materials that have been determined to be non-asbestos containing.

1.2 SUMMARY OF WORK

Abatement Work Area Location	Asbestos Abatement of Work Description	Approximate Quantity
HM-101, HM-102, HM-103, HM-104, HM-105	**NOTE A1** ABATE SPRAY-ON FIREPROOFING, ASSOCIATED OVERSPRAY AND DEBRIS IN LOCATIONS AS NOTED. SPRAY-ON FIREPROOFING WAS INSTALLED ON STRUCTURAL MEMBERS AND CEILING SUBSTRATES THROUGHOUT THE BUILDLING. ABATEMENT INCLUDES THE REMOVAL OF RESIDUAL SPRAY-ON FIREPROOFING FROM LOCATIONS THAT WERE PREVIOUSLY ABATED, INACCESSIBLE LOCATIONS (CAVITITES/CHASES/PLENUMS, ETC) AND ANY DEBRIS THAT HAS CONTAMINATED BUILDING MATEIRALS, EQUIPMENT, SYSTEMS, ETC. ALL SELECTIVE DEMOLITION IN THESE LOCATIONS SHALL BE CONDUCTED UNDER ABATEMENT CONDITIONS DUE TO PRESUMED DEBRIS/CONTAMINATION.	40,000 SF
HM-101, HM-102, HM-103, HM-104, HM-105	**NOTE A2** ABATE ACM SPRAY-ON FIREPROOFING CONTAMINATED BUILDING COMPONENTS/SYSTEMS ASSOCIATED WITH MECHANICAL, PLUMBING AND ELECTRICAL SYSTEMS IN LOCATIONS AS NOTED. ALL SELECTIVE DEMOLITION SHALL BE CONDUCTED UNDER ABATEMENT CONDITIONS. COORDINATE ISOLATION/DE-ENERGIZING WITH THE BUILDING OWNER AND OWNER’S REPRESENTATIVE.	10,000 SF

Abatement Work Area Location	Asbestos Abatement of Work Description	Approximate Quantity
HM-101, HM-102, HM-103, HM-104, HM-105	**NOTE A3** ABATE ACM AND PACM THERMAL SYSTEM INSULATION (MUDDED FITTINGS,VALVES, PIPE INSULATION AND ANY ASSOCIATED DEBRIS IN LOCATIONS AS NOTED. THE ABATEMENT CONTRACTOR ACKNOWLEDGES THAT THEY ARE RESPONSIBLE FOR ALL SELECTIVE DEMOLITION REQUIRED TO ACCESS ACM/PACM. ALL SELECTIVE DEMOLITON SHALL BE CONDUCTED UNDER ABATEMENT CONDTIONS. REMOVAL SHALL INCLUDE ADJACENT NON-ACM INSULATION TO 6” BEYOND ACM TO PREVENT ANY CONTAMINATION. COORDINATE REMOVALS WITH M/E/P.	2,000 LF
HM-101, HM-102, HM-103, HM-104, HM-105	**NOTE A4** ABATE PACM FIRE DOORS AND ASSOCIATED FRAMES PRESUMED TO BE CONTAMINATED WITH SPRAY-ON FIREPROOFING IN LOCATIONS AS NOTED.	600 SF
HM-101, HM-102, HM-103, HM-104, HM-105	**NOTE A5** ABATE WINDOW, DOOR, LOUVER FRAMES PRESUMED TO BE CONTAMINATED WITH PACM SPRAY-ON FIREPROOFING. ABATEMENT SHALL INCLUDE REMOVAL AND DISPOSAL OF THE ENTIRE COMPONENT. THE CONTRACTOR ACKNOWLEDGES THESE FRAMES REQUIRE PCB ABATEMENT OF CAULKS/SEALANTS AS PART OF THIS WORK. WASTE STREAMS SHALL BE SEGREGATED AND DISPOSED OF ACCORDINGLY.	12,000 SF
HM-103, HM-104 & HM-105	**NOTE A6** ABATE ASBESTOS-CONTAINING EXTERIOR SPRAY-ON FIREPROOFING AND ASSOCIATED DEBRIS, OVER-SPRAY, CONTAMINATED PLASTER SOFFITS, RECESSED LIGHT FIXTURES, ETC. IN LOCATIONS AS NOTED.	4,000 SF
HM-103, HM-104 & HM-105	**NOTE A7** ABATE ACM FLOORING MATERIALS (FLOOR TILE, COVERING, ADHESIVE, COVE BASE, UNDERLAYMENT, VAPOR BARRIER AND WATERPROOFING MEMBRANE AND NON-ACM FLOORING MATERIALS LOCATED WITHIN ABATEMENT AREAS. USE OF SOLVENTS/CHEMICAL MASTIC REMOVAL IS PROHIBITED; MECHANICAL METHODS OF MASTIC REMOVAL ARE REQUIRED. ACM FLOORING MAY EXIST UNDER CARPETING, NON-ACM FLOORING, WALLS, CABINETRY, ETC. THE CONTRACTOR IS RESPONSIBLE FOR ALL SELECTIVE DEMOLTION UNDER ABATEMENT CONDITIONS.	6,500 SF

Abatement Work Area Location	Asbestos Abatement of Work Description	Approximate Quantity
HM-101, HM-102, HM-103 & HM-104	**NOTE A8** CONTRACTOR TO PROVIDE PENETRATIONS THROUGH ASBESTOS-CONTAINING SPRAY-ON CONTAMINATED WALLS IN AREAS INDICATED. WALL CAVITIES SHALL BE ENCAPSULATED/SEALED WITH A SPRAY FOAM TYPE SEALANT TO PREVENT CONTAMINATION FROM EXISTING THE WALL. ALL WORK TO BE PERFORMED WITH A NEGATIVE PRESSURE ENCLOSURE. THIS WILL REQUIRE MULTIPLE MOBILIZATIONS, SCHEDULE TO BE DETERMINED BY PRIME CONTRACTOR AND THEIR SUB-CONTRACTORS.	ASSUME 1000 PENETRATIONS (4” X 4”)
THROUGHOUT	**NOTE A9** CONTRACTOR TO REMOVE PIPE/CONDUIT/FIN TUBE THAT PENETRATES THROUGH ASBESTOS-CONTAINING SPRAY-ON CONTAMINATED WALLS IN AREAS INDICATED. WALL CAVITITIES SHALL BE ENCAPSULATED/SEALED WITH SPRAY FOAM TYPE SEALANT TO PREVENT CONTAMINATION FROM EXITING THE WALL. ALL WORK TO BE PERFORMED WITH A NEGATIVE PRESSURE ENCLOSURE.	ASSUME 200 PENETRATIONS (4” X 4”)
THROUGHOUT	**NOTE A10** ABATE CABINET HEATERS, COORDINATE WITH (M) (E) (P) SERIES DRAWINGS.	100 SF
THROUGHOUT	**NOTE A11** ABATE HVAC SEAM SEALANT, MASTICS, AND SPRAY-ON FIREPROOFING CONTAMINATION. ALL HVAC EQUIPMENT/ COMPONENTS SHALL BE DEMOLISHED UNDER ABATEMENT CONDITIONS. COORDINATE WITH OWNER AND OTHER TRADES FOR ISOLATING/DE-ENERGIZING HVAC EQUIPMENT AND ANY ENABLING PHASE ABATEMENT REQUIRED FOR ISOLATION.	1,000 SF
HM-101, HM-102, HM-103, HM-104 & HM-105	**NOTE A12** ABATE PRESUMED ASBESTOS-CONTAINING MIRROR MASTIC TO CLEAN SUBSTRATE.	80 SF
HM-101, HM-102, HM-103 & HM-104	**NOTE A13** ABATE PRESUMED ELEVATOR COMPONENTS (INCLUDING BUT NOT LIMITED TO DOORS, CAB, ELECTRICAL COMPONENTS, ETC.) IN LOCATIONS AS NOTED.	1,200 SF
HM-102	**NOTE A14** ABATE ACM SINK MASTIC AND ASSOCIATED COUNTERTOP, UNDERCOATING, MASTIC, CAULK AND SEALANTS. COORDINATE DISCONNECTS WITH OWNER/OWNER’S REPRESENTATIVES, OTHER TRADES.	80 SF

Abatement Work Area Location	Asbestos Abatement of Work Description	Approximate Quantity
HM-102, HM-103,	**NOTE A15** ABATE PRESUMED ASBESTOS-CONTAINING DRINKING FOUNTAIN AND ANY ASSOCIATED PIPE / PIPE FITTING INSULATION. CONTRACTOR IS RESPONSIBLE FOR SELECTIVE DEMOLITION (TO BE CONDUCTED UNDER ABATEMENT CONDITIONS) REQUIRED TO ACCESS ACM. COORDINATE WITH OTHER TRADES FOR ISOLATION.	4 Units
HM-102, HM-103 & HM-104	**NOTE A16** ABATE PRESUMED ASBESTOS-CONTAINING WALL PANEL MASTIC.	1,000 SF
HM-104	**NOTE A17** ABATE PRESUMED ASBESTOS-CONTAINING MASTIC AT LEADED FLOOR DRAIN REMOVAL LOCATIONS. COORDINATE WITH (P) SERIES DRAWINGS AND LEAD REMOVAL NOTE L2.	120 SF
HM-103 HM-104	**NOTE A18** REMOVE EXTERIOR BRICK WALLS IN LOCATIONS AS NOTED IN PROJECT DOCUMENTS, INCLUDING ROOF TOP BRICK WALL, SURROUNDING MECHANICAL EQUIPMENT, UNDER ABATEMENT CONDITIONS TO ACCESS AND ABATE ASBESTOS-CONTAINING SPRAY-ON FIREPROOFING ON STRUCTURAL MEMBERS OR AND/OR ANY MASTIC/MEMBRANES. REMOVAL AT ROOF LEVEL SHALL ALSO INCLUDE THE ABATEMENT OF THE SURROUNDING ROOFING FIELD, FLASHINGS, CEMENTS AND CAULKS.	2000 SF
HM-102	**NOTE A19** ABATE ASBESTOS-CONTAINING FOUNDATION WATERPROOFING/MASTIC TO SUPPORT NEW EXTERIOR PENETRATIONS. EXCAVATION TO EXPOSE BELOW GRADE FOUNDATION COMPONENTS TO BE COMPLETED BY OTHER TRADES. FOUNDATION WATERPROOFING/MASTIC TO BE REMOVED TO CLEAN SUBSTRATE. COORDINATE LOCATION AND SIZE OF REMOVALS WITH M/E/P SERIES DRAWINGS.	ASSUME 2,000 SF
HM-102	**NOTE A20** ABATE PRESUMED ASBESTOS-CONTAINING TRANSITE AND STEAM PIPING, LOCATED BELOW GRADE, EXCAVATION TO EXPOSRE PIPING TO BE COMPLETED BY OTHER TRADES). COORDINATE REMOVALS WITH DRAWING C-121.	800 LF

Abatement Work Area Location	Asbestos Abatement of Work Description	Approximate Quantity
HM-106	**NOTE A21** ABATE ASBESTOS-CONTAINING ROOFING MATERIALS IN LOCATIONS AS NOTED. REMOVAL SHALL INCLUDE THE ENTIRE ROOFING SYSTEM (ALL LAYERS, INCLUDING BUT NOT LIMITED TO: FIELD, FLASHINGS, COUNTER FLASHINGS, SEALANTS, CAULKS, HOT MOPS, CEMENTS, ETC.) TO CLEAN SUBSTRATE. CONTRACTOR ACKNOWLEDGES THE PRESENCE OF INSTALLED ACM FIREPROOFING ON THE UNDERLYING SIDE OF THE ROOF DECK AND STRUCTURAL MEMBERS AND THEREFORE, SHALL AVOID DISTURBING THIS MATERIAL BY MINIMIZING VIBRATIONS AND CONTROLLING WATER USAGE DURING ABATEMENT.	24,000 SF
HM-106	**NOTE A22** ABATE PRESUMED ASBESTOS-CONTAINING INTERIOR ROOF DRAIN INSULATION CONTAMINATED WITH ASBESTOS-CONTAINING OVER-SPRAYED FIREPROOFING AND ANY ASSOCIATED OVERSPRAY, IN LOCATIONS AS NOTED.	80 SF
HM-106	**NOTE A23** ABATE RESIDUAL ASBESTOS-CONTAINING WALL FLASHING MATERIALS FROM SUBSTRATE, IN LOCATIONS SCHEDULED TO REMAIN.	200 LF

A. GENERAL CONDITIONS

B. The Contractor acknowledges that the quantities of asbestos-containing materials and presumed asbestos-containing materials shall be field-verified, prior to submission of bid. Variations of ±20% in the quantities indicated shall be acknowledged by the Contractor and shall be reflected in their price.

C. The Contractor’s pricing shall include costs for all labor, materials, equipment, asbestos project notifications and fees, building permits and fees, insurance, bonding, overhead and profit, and all other costs necessary to complete the work, as specified.

D. The Contractor is responsible for transport of all asbestos waste by NYSDEC hauler to a NYSDEC permitted landfill.

E. All work shall be performed in accordance with the project design specifications and all applicable federal, state, and local regulations. When conflicts occur between the project design documents and federal, state, and/or local regulations, the most stringent

requirement shall apply. The Contractor shall comply with the following, except where more stringent requirements are shown or specified:

F. Federal Regulations:
1. OSHA 29 CFR Part 1910.1001 – Asbestos
2. OSHA 29 CFR Part 1910.1200 – Hazard Communication
3. OSHA 29 CFR Part 1910.134 – Respiratory Protection
4. OSHA 29 CFR Part 1910.145 – Specification for Accident Prevention Signs and Tags
5. OSHA 29 CFR Part 1926 – Construction Industry
6. OSHA 29 CFR Part 1926.1101 – Asbestos, Tremolite, Anthophyllite, and Actinolite
7. OSHA 29 CFR Part 1926.500 – Guardrails, Handrails, and Covers
8. USEPA 40 CFR Part 61, Subpart A – General Provisions
9. USEPA 40 CFR Part 61, Subpart M – Asbestos NESHAP
10. USEPA 40 CFR Part 763, Subpart E, Asbestos Hazard Emergency Response Act (AHERA)

G. New York State Regulations:
1. NYSDOL 12 NYCRR Part 56 – “Asbestos,” as amended 3/21/2007
2. NYSDEC 6 NYCRR Parts 360 and 364 – Waste Disposal & Transportation
3. NYSDOH 10 NYCRR Part 73 – Asbestos Safety Program Requirements
4. All Local Regulations

H. Standards and Guidance Documents:
1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection
2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
3. USEPA 560/585-024, Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book)
4. USEPA 530-SW-85-007, Asbestos Waste Management Guidance
5. All applicable building and fire codes.
6. The Contractor accepts that multiple means of clearance criteria will be utilized for final clearance criteria based on the applicable regulatory requirements for the abatement work performed. Final visual inspections and clearance air sampling will be utilized to determine satisfactory completion of the asbestos abatement work of this project. Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM) analysis of air samples will be utilized to determine satisfactory clearance, based upon the size of the regulated work area.

I. The Abatement Contractor shall be responsible for, but not limited to, the following:
1. Submission and approval of required local, state and federal notifications, notification fees and applicable variances prior to commencement of work, as required by regulations.
2. Verification of all site conditions and locations and quantities of all ACM. Abatement Contractor shall immediately notify Hazardous Material Engineer of any discrepancies noted.

3. Posting of the building to provide notification of the abatement activities, as required under ICR 56, section 56-3.6. The posting shall occur ten (10) calendar days prior to commencement of work at the site by the Abatement Contractor and shall be placed at all direct means of access to the floor, including all stairways, elevators, hallways, corridors, exterior doors, and emergency egress points. Each posting shall include description of the areas in which the work will be conducted; the types and amounts of ACM being removed; commencement and completion dates of the work; name and asbestos handling license number of the Abatement Contractor; name and address of the air monitoring firm and the laboratory for the project; and a statement that it is unlawful for any person to interfere with or remove the posting.
4. Removal of all asbestos material within the areas indicated on the project plans.
5. All movable objects inside abatement work areas shall be removed from the work areas as part of the initial work area cleaning prior to abatement.
6. Abatement Contractor shall inspect facility and ensure that all asbestos material has been removed in accordance with the specifications prior to coordinating final visual inspection by the Project Monitor. Visual inspection by Project Monitor shall not be coordinated until such time as the Abatement Contractor's Project Supervisor has deemed that all abatement and cleaning work has been sufficiently completed in the respective regulated work area.
7. Furnish all labor, materials, services, insurance and equipment necessary to carry out the removal operation in accordance with applicable regulations and codes.
8. All waste shall be transported to Seneca Meadows NYSDEC-permitted waste disposal site for proper disposal. Transportation of waste shall be conducted by a hauling firm having a valid 6NYCRR Part 364 waste transporter permit issued by the New York State Department of Environmental Conservation.
9. Post all applicable regulations, licenses, permits, certifications, and other necessary documentation at the job site.
10. Maintain the required log of all persons entering work area.
11. Provide Hazardous Material Engineer with close-out documentation containing all information pertaining to the removal and disposal of asbestos containing materials.

1.3 OWNER RESPONSIBILITIES

A. The Owner shall be responsible for:
   1. Moving items out of areas affected by abatement work activities.
   2. Providing a source for electricity and water at the project site.
   3. Hiring an independent, third-party asbestos project monitoring / air sampling firm.

1.4 CONTRACTOR RESPONSIBILITIES

A. The Contractor shall be responsible for:
   1. Performing the asbestos abatement work in accordance with all applicable federal, state, and local regulations. Where conflicts occur between federal, state, and local regulations, the most stringent shall apply. As such, the Contractor shall include all necessary costs in their price to complete the work in a legal and safe manner.

2. Providing supervisors and workers who are competent, trained, and medically fit to conduct the asbestos abatement work as well as all materials and equipment necessary to satisfactorily complete the work.
3. Collection and analysis of personal exposure assessment air samples of his employees as required by applicable OSHA standards. The third-party asbestos project monitoring / air sampling firm shall not be responsible for the collection, shipping / delivery, or analysis of the Contractor's personal exposure assessment air samples on this project.
4. Completing the project as specified in the design documents. The Contractor accepts that the asbestos abatement work is not complete until satisfactory final visual inspections are made and after clearance air testing results are deemed to be acceptable, as applicable.
5. Packaging of all asbestos waste generated by the work in accordance with all applicable federal, state, and local regulations, for transporting, and disposing of at Seneca Meadows, as required by the Owner.
6. Ensuring regulated work area security during the course of the project, so that unauthorized personnel do not enter regulated work areas.
7. Providing emergency plans and emergency telephone numbers to on-site abatement personnel. The emergency plans and telephone numbers shall be kept on site at all times during the project.
8. Obeying the Owner's policies and procedures pertaining to work on-site.
9. Ensuring that no employee of his company speaks to the media without written permission from the Owner.
10. Complying with the contractual requirements set forth by the Owner.
11. Posting a notice at all building entrances notifying all persons of the Contractor's intent to conduct asbestos abatement, in accordance with State and Federal requirements.
12. Notifying the NYSDOL and USEPA about the asbestos abatement work and paying the associated fees, as applicable.
13. Contractor shall follow the direction of the Owner and Owner's Representatives pertaining to schedule, health / safety issues, and other site activities. The Contractor shall be responsible for the legal means and methods of performing the work in accordance with the contract.

1.5 PERSONAL PROTECTIVE EQUIPMENT

A. The Contractor shall be responsible for providing his personnel with adequate personal protective equipment to perform the work on this project as per the applicable federal and state regulations.

B. The Contractor will be responsible for collecting OSHA personal asbestos samples for their workers on this project. Representative samples shall be taken daily, and sample results shall be posted at the personal decontamination unit within 48 hours of collection. The Contractor is responsible for providing their employees with adequate respiratory protection based upon the sample results received.

C. Street clothing is not permitted inside regulated work areas during abatement activities.

D. The Contractor is responsible for providing the Project Designer, the Project Monitor, Owner/Owner's Representative, and state and federal inspectors with personal protective equipment (PPE). This may include some or all of the following: protective clothing, respirators, high efficiency particulate air (HEPA) cartridges, hard hats, gloves, eye protection, and rubber disposable boots.

E. Protective suits and respiratory protection shall be required (at a bare minimum) during all asbestos removal activities, regardless of any negative exposure assessment data.

1.6 SUBMITTALS

A. Qualification Submittals. If requested, the following information shall be transmitted to the Owner / Owner's Representative prior to contract award:
   1. Contractor's Asbestos Handling License issued by the NYSDOL.

B. A notarized statement, signed by an officer of the company, containing the following information:
   1. Any federal, state, or local regulatory agency citations, violations, notices, orders to comply, or penalties recorded against the asbestos abatement contractor in the last three (3) years.
   2. Any claims or legal proceedings in which the Contractor has been involved in the past three (3) years.
   3. Any Occupational Safety and Health Administration (OSHA) fines and/or citations, and a list of OSHA recordable accidents per year for the last three (3) years.
   4. Any asbestos related projects where a contract has been terminated, including project name, client, dates, and reasons for termination.
   5. A minimum of five (5) project references for projects similar in nature to this project that have been self-performed and completed in the past three (3) years including the project name and location, scope of work, client, and contact person's name, telephone number, and e-mail address.

C. Pre-Abatement Submittals. The following information shall be transmitted to the Project Designer at least ten (10) days prior to the commencement of work activities:
   1. Contractor's Asbestos Handling License issued by the NYSDOL.
   2. NYSDOL Asbestos Project Notification.
   3. USEPA Notification of Demolition & Renovation.
   4. Asbestos Project Notice to be posted at the building prior to the start of the work, as required by ICR 56-3.6.
   5. NYSDEC waste transporter permit.
   6. NYSDEC landfill permit, where asbestos project wastes from the site will be disposed.
   7. Project schedule showing phases of work for each regulated work area including, but not limited to, mobilization, work area preparation, abatement/removal, cleanings, work area dismantlement, and demobilization.
   8. NYSDOL-approved asbestos project variance to be used on the project, if applicable.

9. Wastewater discharge permit required by state, county, or local municipality. If a permit is not required or will not be obtained, submit a written statement describing how wastewater from this project will be collected and disposed.
10. Safety Data Sheets (SDS) for all chemicals, solvents, products, and materials utilized on the project.
11. Manufacturer's specifications/certifications for all materials and equipment utilized on the project.
12. Written notifications to local fire, rescue, and emergency agencies informing them of the nature and schedule of the work at the site.
13. List of contact persons and emergency phone numbers for Contractor personnel to be posted on the project site.

D. Asbestos abatement personnel/worker documentation, including:
1. NYSDOL Asbestos Handling Certificates.
2. NYSDOH 2832 Asbestos Training Certificates.
3. Medical examinations/evaluations.
4. Respirator fit test certifications.
5. OSHA 10-Hour Construction Safety Training certificates.
6. The Contractor shall not proceed with any work until the pre-abatement submittals have been approved by the Owner/Owner's Representative.

E. Abatement Submittals. The following information shall be transmitted during the course of the work as per Specification Section 01 33 00:
1. OSHA personal exposure assessment air sampling data. The Owner, Owner's Representatives, and Project Designer are not responsible for the interpretation of these results. The intent is only to show that the Contractor is collecting these samples as required by OSHA.
2. A daily list of the personnel on-site accompanied by their NYSDOL Asbestos Handling Certificate number.

F. Post-Abatement/Closeout Submittals. The following information shall be transmitted within 30 days after completion of the work, as per Specification Section 01 33 00:
1. Copies of all waste disposal manifests, disposal logs, and weight tickets. All original waste disposal records shall be submitted directly to the Owner/Owner's Representative by the Contractor.

G. Copy of supervisor's daily project log as required by ICR 56-7.3 documenting all pertinent events that occur throughout the project and including the following:
1. Elevated air sampling results shall be noted along with the time of the work cessation, results of barrier and negative air system inspection, and a summary of any necessary repairs and the required cleaning(s).
2. Manometer readings to be documented twice per work shift, if applicable.
3. Daily (including days without work shifts) inspection results of negative-air ventilation system and any necessary repairs, if applicable.
4. Daily (including days without work shifts) inspections of HVAC system positive pressurization and any necessary repairs, if applicable.

5. Daily (including days without work shifts) inspection results of barriers and any necessary repairs, if applicable. Inspections shall be twice per work shift on days with scheduled work.
6. Daily testing of barriers and enclosures as per ICR 56-8.2(f) and any necessary repairs, if applicable.
7. Daily cleaning of enclosures to be documented at the end of each work shift, if applicable.
8. Results of each visual inspection and time of each intermediate completion, if applicable.
9. Results of visual inspection by Supervisor and Project Monitor for each asbestos abatement work area prior to clearance air sampling.
10. Entry/exit logs for each asbestos abatement work area.
11. Final NYSDOL and USEPA project notifications, and any asbestos variances, if applicable.
12. Any other submittal requested by Owner, Owner's Representatives, or Project Designer.
13. The Owner / Owner's Representative shall ensure that the Contractor has met all the contractual obligations to close out this project. Failure to provide all of the requested project closeout documentation may result in the delay of payment to the Contractor. The Contractor shall not be entitled to any additional compensation caused by their failure to submit the requested closeout information in a timely manner.

PART 2 - PRODUCTS

A. MATERIALS & EQUIPMENT

B. The Contractor shall be responsible for:
   1. Providing all materials and equipment necessary to complete the work.
   2. Providing safe and reliable materials and equipment.
   3. Providing personal protective equipment for all abatement personnel.
   4. Providing HEPA-filtered air filtration devices and HEPA vacuums.
   5. Providing continuous negative air pressure within regulated work areas for the duration of the project, as applicable.

C. Utilizing barrier tape and danger signs to keep unauthorized personnel away from the work area. Danger signs shall contain the following language:
   1. DANGER
   2. CONTAINS ASBESTOS FIBERS
   3. AVOID CREATING DUST
   4. CANCER AND LUNG DISEASE HAZARD
   5. Utilizing airless sprayers to limit airborne dust in regulated work areas.
   6. Utilizing flame-retardant 6-mil polyethylene sheeting for the construction of abatement work areas, decontamination units, and the lining of waste containers.
   7. Utilizing 6-mil polyethylene bags for the containerization of all asbestos wastes.
   8. Utilizing duct tape or approved equivalent to seal polyethylene sheeting and waste disposal bags.

9. Utilizing electrical equipment and power cords in compliance with all applicable OSHA standards.
10. Utilizing Ground Fault Interrupters (GFIs) or Ground Fault Circuit Interrupters (GFCIs) on all power sources.
11. Any miscellaneous products not covered in this specification must have written approval from the Project Architect and Project Designer prior to use on-site.
12. Any miscellaneous products used at the site must be accompanied by manufacturer's product information and safety data sheet (SDS). This information must be submitted to the Project Architect and Project Designer prior to the products arriving on site. The Contractor may not proceed until the products have been approved for use in writing by the Project Architect and Project Designer.

PART 3 - EXECUTION

3.1 UTILITIES

A. All water and electrical service connections shall be installed by the Contractor in accordance with all applicable federal, state, and local codes, rules, and regulations.

B. The Contractor shall be responsible for the maintenance of all electrical cords and water hoses and keeping them in a secure location to prevent unnecessary tripping and/or slipping hazards.

C. The Contractor shall temporarily shut down / de-energize, isolate / seal, modify, and/or alter existing mechanical, HVAC, electrical, plumbing, and any other related systems, services, and utilities at the site, as required by applicable regulations, prior to the start of the asbestos abatement work. All such work shall be carefully coordinated with the Owner and Owner's Representative.

D. Existing mechanical, HVAC, electrical, plumbing, and all other building systems, services, and utilities within regulated work areas that are to remain in operation shall be adequately protected by the Contractor during all work activities.

3.2 DECONTAMINATION FACILITIES

A. All personal and waste decontamination facilities shall be constructed, installed, or otherwise provided by the Contractor to meet the requirements of ICR 56 and shall be deemed adequate by the Project Monitor prior to the commencement of any asbestos abatement preparation work.

B. The personal decontamination unit shall be equipped with one (1) shower per six (6) full-shift abatement workers.

C. Decontamination units shall be cleaned at the beginning, during, and end of each work shift. Accumulations of dirt / debris in decontamination units shall not be permitted.

3.3 NEGATIVE PRESSURE VENTILATION

A. Negative air pressure ventilation shall be installed for all OSHA Class I, Class III, and interior Class II regulated asbestos abatement work areas.

B. The negative air pressure equipment shall operate continuously, 24 hours a day, from startup of negative air pressure ventilation equipment through cleanup operations and clearance air sampling until satisfactory clearance air sampling results are obtained.

C. If more than one (1) primary HEPA-filtered ventilation unit is installed, the units shall be turned on one at a time and the integrity of temporary hard-wall isolation barriers checked for secure attachment. A minimum of one (1) additional negative air pressure ventilation unit, having a capacity of at least equal to that of the primary unit, shall be installed as a backup unit to be used upon primary unit failure and during primary unit filter changes.

D. Negative air pressure ventilation equipment shall be installed and operated continuously to provide at least four (4) air changes per hour in the regulated work area including during clearance air sampling.

E. The exhaust shall be vented to the outside of the building or structure, to a controllable area away from public access. Each negative pressure ventilation unit exhaust duct shall not terminate less than 15 feet from a receptor or adversely affect the air intake of any building or structure. If the exhaust duct termination location cannot be met due to allowable space restrictions or the regulated abatement work area being located above the ground floor, the exhaust shall terminate at the exterior of the building or structure, and all receptors within 15 feet of the exterior exhaust duct termination location shall be plasticized with two (2) layers of 6-mil polyethylene. Exhaust tubes may be grouped together in banks of no more than five (5) tubes, with each tube exhausting separately and the bank of tubes terminating together at the same controlled area.

F. Construction fence at a height of four (4) feet with appropriate signage shall be installed a minimum of 10 feet from the end of the exhaust duct tube or bank of duct tubes to surround and control the area from public access. For ground level exhaust duct terminations at the immediate exterior of the building/structure, the fence shall be installed at the tube discharge location.

G. Manometers shall be used to document the pressure differential for all OSHA Class I large and small size regulated asbestos abatement work areas. A minimum of -0.02 column inches of water pressure differential, relative to pressure outside the regulated work area, shall be maintained within the regulated work area, as evidenced by manometric measurements. Once installed, on a daily basis and at least twice per work shift, the Contractor shall document the manometer readings in the daily project log. The manometer shall be installed and made operational once negative air ventilation has been established in the regulated work area. At a minimum, magnahelic manometers shall be calibrated semi-annually, and a copy of the current calibration certification shall be posted at the work site, as required by ICR 56.

H. The Contractor shall be responsible for the following:
   1. Monitoring of negative air pressure equipment and records of the daily manometer readings in the supervisor’s project log.

2. Stoppage of activities when negative air pressure is lost or is less than required. The Contractor shall not resume activities until constant negative air pressure has been reestablished and maintained for at least 30 minutes.

3.4 PRE-CLEANING ACTIVITIES

A. Pre-cleaning of regulated work areas shall be conducted in accordance with ICR 56.

B. The Contractor shall request a visual inspection by the Project Monitor to ensure that regulated work areas have been satisfactorily pre-cleaned prior to commencement of work area preparation activities.

3.5 CRITICAL & ISOLATION BARRIERS

A. After the pre-cleaning activities are completed, the Contractor shall install critical barriers and isolation barriers in accordance with ICR 56.

B. Critical barriers shall be constructed to seal off all openings and penetrations to regulated work areas including, but not limited to, operable windows and skylights, doorways and corridors that shall not be used for passage, ducts, grilles, diffusers, HVAC system seams, and any other penetrations to surfaces within the regulated work areas. Critical barriers shall be constructed using two (2) independent layers of 6-mil fire-retardant plastic sheeting, with each layer sealed separately with duct tape. Caulk and fire-retardant expandable foam may be used to seal small openings or penetrations. Doorways and corridors, which shall not be used for passage during the asbestos abatement work, shall also be sealed.

C. Temporary hard-wall barriers to complete containments/enclosures and establish regulated work areas shall be constructed using the following framing, sheathing, sealing, and plasticizing criteria:
1. Isolation barrier partitions shall be constructed of wood or metal framing in all openings greater than 32 square feet except, where any one dimension is one (1) foot or less, framing is not required. Existing walls or framing may be used to support isolation barrier partition framing and sheathing.
2. Plywood or oriented strand board (OSB) sheathing of at least ⅜-inch thickness shall be fastened to the regulated work area side of the barrier partition.
3. Edges of the isolation barrier partition at the floor, ceiling, walls, and fixtures and seams within the partition sheathing shall be sealed using caulk, fire-retardant expandable foam, or tape to form an airtight seal.
4. The regulated work area side of isolation barrier partitions shall be covered with two (2) layers of 6-mil fire-retardant plastic sheeting with staggered joints and sealed airtight.
5. Smoke testing shall be conducted by the Contractor prior to the start of abatement activities and at least once a day thereafter until satisfactory clearance air sampling results have been obtained to ensure the effectiveness of all critical barriers, isolation barriers, personal and waste decontamination system enclosures, and regulated work area enclosures. Negative air pressure ventilation units shall be in operation during this testing. Testing of barriers and enclosures is not required on

days when there are no Phase IIB or cleaning activities scheduled. Test results, observations and any modifications shall be documented in the daily project log by the asbestos abatement supervisor.

6. The Contractor shall inspect all barriers at least twice daily – before the start of and following the completion of each day's abatement activities. Inspections are also required on days when there is no Phase II work or support activities scheduled. Inspections and observations shall be documented in the daily project log by the asbestos abatement supervisor.

3.6 ASBESTOS HANDLING & CLEANING ACTIVITIES

A. The Contractor shall conduct all asbestos abatement activities in accordance with ICR 56 or an approved asbestos project variance.

B. Negative air machines shall be utilized at all regulated work areas, until satisfactory air sample results have been achieved. HEPA vacuums may only be utilized to provide continuous negative air pressure ventilation on minor-sized abatement projects.

C. All asbestos materials shall be removed using wet methods. Dry removal, sweeping, wire brushing, use of pressurized water/pressurized air, or other inappropriate techniques will not be permitted.

D. Airless sprayers shall be utilized to control airborne asbestos fiber concentrations.

E. The Contractor is responsible for taking appropriate measures to reduce nuisance odors and noise from migrating to other areas of the building.

F. Waste shall be immediately bagged and be transported to the waste decontamination enclosure. Waste bags shall then be cleaned in the waste decontamination enclosure, double-bagged, labeled, and transported to the waste dumpster, trailer, etc.

G. Waste bag transfer shall take place inside a cart that has been lined with two (2) layers of 6-mil polyethylene. This cart shall be covered by polyethylene during any waste transfer activities and be labeled with appropriate asbestos signage.

H. Workers shall wear PPE during work area preparation, abatement activities, cleaning, and during any other work area activities until final air clearance criteria has been achieved.

I. The Contractor shall be responsible for providing the Project Monitor / Air Sampling Technician with sufficient power to conduct air sampling at the project site. The Contractor shall also provide the Project Monitor / Air Sampling Technician with access to the decontamination unit and hot water on days when final/clearance air sampling is required (even when abatement work is not taking place).

3.7 WASTE DISPOSAL

A. The Contractor shall ensure that all asbestos waste/debris is sufficiently wet prior to being bagged/containerized for disposal.

B. Bags, drums, or other acceptable packages/containers used for asbestos waste shall be labeled with appropriate asbestos waste generator tags/labels.

C. Two (2) 6-mil polyethylene bags or two (2) layers of 6-mil plastic sheeting shall be utilized for the disposal of all asbestos waste.

D. A daily count of asbestos waste bags, drums, containers, etc. shall be recorded by the asbestos abatement supervisor. This count shall be provided to the Project Monitor each day.

E. Waste manifests shall accompany all regulated asbestos-containing material (RACM) waste that is removed from the site. Original waste manifests shall be submitted directly to the Owner/Owner's Representative.

F. Vehicles used for the transport of all asbestos waste shall bear all appropriate permit tags, markings, and placards.

3.8 INSPECTIONS

A. The Contractor shall not interfere, impede, or delay any inspections by the Owner/Owner's Representative, Project Designer, Project Monitor, or federal, state, or local inspectors.

B. The Contractor shall request inspections from the Project Monitor at the following intervals, as applicable to the project:
1. Upon completion of the decontamination system enclosure(s).
2. Upon completion of the pre-cleaning effort.
3. Upon completion of the preparation of the work area.
4. Upon completion of the abatement process.
5. Upon completion of teardown/dismantling activities.
6. The asbestos abatement supervisor shall be responsible for adequately documenting inspections in the daily project log.

3.9 ASBESTOS PROJECT MONITORING/AIR SAMPLING

A. The Contractor shall not include any costs in their price for project monitoring or air sampling. The Contractor will not be responsible for the selection or payment of the Project Monitoring/Air Sampling firm.

B. The Project Monitor/Air Sampling Technician will be responsible for the following:
1. Conducting air sampling during the asbestos abatement phase of the project.
2. Conducting a visual inspection for completeness of abatement and completeness of cleanup as per the provisions of the current ASTM Standard E1368 - "Standard

Practice for Visual Inspection of Asbestos Abatement Projects." An entry shall be made into the daily project log by both the asbestos abatement supervisor and the individual performing the inspection, detailing the findings of the visual inspection. The full name and NYSDOL asbestos handling certificate number of the certified individual performing the inspection shall also be documented in the supervisor's daily project log.

3. Performing aggressive air sampling techniques for clearance air sampling.
4. Collecting clearance air samples.
5. The Contractor understands that a Project Monitor will be retained by the Owner to oversee the asbestos abatement work and that the Owner/Owner's Representative has authorized the Project Monitor to stop the Contractor's work if the Contractor is not following the contract documents or the applicable codes, rules, and regulations. Work shall only be permitted to commence if allowed by the Owner/Owner's Representative after corrective actions have been made. The Contractor acknowledges that it is their responsibility to follow all applicable rules and regulations and failure to do so may result in lost time and/or dismissal from site at no cost to the Owner, Project Designer, or Project Monitor. The Contractor shall not be compensated for any lost time, labor, materials, etc., due to inappropriate action.

END OF SECTION 02 82 13

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SECTION 02 82 15 - PCB HANDLING AND DISPOSAL

PART 1 - GENERAL

1.1 GENERAL NOTES

A. Current federal and state regulations require the implementation of appropriate Industrial Hygiene techniques, while handling and disposing of polychlorinated biphenyls (PCBs). This Section was developed to ensure the completeness of abatement procedures, while ensuring the health & safety of workers, the general public and the environment.

B. Materials determined to be PCB-containing at a concentration at or above 50 parts per million (ppm) are considered PCB bulk waste (hazardous) by the USEPA and NYSDEC. Concentrations of PCBs in solids greater than 50 ppm must be handled and disposed of in accordance with all applicable state and federal regulations.

C. The Contractor shall follow the procedures within this Section to ensure that any removal activities that may disturb PCB-containing materials are conducted in a manner that will minimize any potential exposure to the environment, employees, and the general public.

D. Where conflicts occur, the most stringent course of action shall apply.

1.2 SUMMARY OF WORK

WORK AREA LOCATION	WORK DESCRIPTION	APPROXIMATE QUANTITY
HM-101, 102, 103 & 104	**NOTE P1** ABATE PCB-CONTAINING (GREATER THAN 50 PPM) DOOR VISION PANEL GLAZING IN LOCATIONS AS NOTED. PCB CAULKS/GLAZINGS SHALL BE REMOVED AND SEGREGATED FROM MATERIALS SCHEDULED FOR ASBESTOS ABATEMENT	10 LF
HM-101, 102, 103,104, 105 & 106	**NOTE P2** ABATE PCB- CONTAINING CAULKS /SEALANTS IN THEIR ENTIRETY FROM LOCATIONS AS NOTED. THE CONTRACTOR IS REQUIRED TO REMOVE THE ASSOCIATED COMPONENT (WINDOW, DOOR, LOUVER, EXPANSION JOINT, CONCRETE PANEL, ETC.) AS PART OF PCB CAULK REMOVAL OPERATIONS TO ENSURE ALL PCB MATERIALS HAVE BEEN REMOVED. MECHANICAL REMOVAL METHODS ARE PROHIBITED. FOLLOWING SATISFACTORY FINAL VISUAL INSPECTION AND CLEARANCE SAMPLING (IF REQUIRED), THE CONTRACTOR SHALL ENCAPSULATE THE SUBSTRATE WITH A PRODUCT THAT IS APPROVED FOR THE SUBSTRATE, LOCATION AND APPLICATION, BY THE MANUFACTURER AND ARCHITECT. FOLLOWING SATISFACTORY CLEARANCE REQUIREMENTS, THE CONTRACTOR SHALL INSTALL WEATHERTIGHT/SECURITY BARRIERS AT REMOVAL LOCATIONS. TEMPORARY SECURITY BARRIERS SHALL	3,000 LF

WORK AREA LOCATION	WORK DESCRIPTION	APPROXIMATE QUANTITY
	NOTE P2 (Continued) BE CONSTRUCTED IN A MANNER THAT WILL ALLOW THEM TO REMAIN IN PLACE UNTIL INSTALLATION OF NEW COMPONENTS.	
HM-101, 102, 103, 104, 105 & 106	**NOTE P3** ABATE PCB-CONTAINING INTERIOR EXPANSION JOINT CAULK (GREATER THAN 50 PPM) WITHIN A NEGATIVE PRESSURE ENCLOSURE IN LOCATIONS NOTED. REMOVAL SHALL INCLUDE BACKER ROD AND PACKING MATERIALS. BRICK SUBSTRATE IS SCHEDULED TO REMAIN. CONTRACTOR SHALL NOT DAMAGE SUBSTRATE. MECHANICAL REMOVAL METHODS ARE PROHIBITED. FOLLOWING SATISFACTORY FINAL VISUAL INSPECTION AND CLEARANCE SAMPLING (IF REQUIRED), THE CONTRACTOR SHALL ENCAPSULATE THE SUBSTRATE WITH A PRODUCT THAT IS APPROVED FOR THE SUBSTRATE, LOCATION AND APPLICATION, BY THE MANUFACTURER AND ARCHITECT.	200 LF

1.3 SUBMITTALS

A. Pre-Abatement Submittals - The Contractor shall submit the following submittals, prior to the commencement of any abatement activities on-site.

B. Copies of the following worker’s certifications;

C. HAZMAT certificates for all personnel.

D. Medical evaluations to show suitably to wear respiratory protection.

E. Fit test records to show respirator suitability.

F. The Contractor’s proposed plan for conducting work on site, including decontamination locations, procedures, etc.

G. Material Safety Data Sheets (MSDS) – MSDS shall be submitted for all materials and products to be used on-site.

H. A detailed plan for the capture, handling, and disposal of any wastewater to be used on the project.

I. Manufacturers’ certifications for all equipment to be used on the project.

J. Copy of the company’s Hazard Communication Program, Respiratory Protection Plan, and Site Emergency Response Plan.

K. Copy of notifications to the local fire and rescue that work will be conducted at the site.

L. Copies of the emergency phone numbers that will be posted on the personal decontamination unit.

M. Proposed Supervisor on the project, including a list of other projects that the Supervisor has worked on of similar nature.

N. Abatement Submittals – The following submittals should be provided to the Owner's Representative and Environmental Consultant during the abatement process.

O. Personal Air Sample Results for PCB Exposure – These air samples are the responsibility of the Contractor. Results shall be posted on site within 48 hours of collection. The Environmental Consultant and the Owner shall not be responsible for the interpretation of the laboratory results, only to verify that the Contractor is collecting these samples. The Contractor is responsible for providing personal protective equipment based upon the results of this testing.

P. A daily list of the personnel on-site.

Q. Copies of workers certifications, medical evaluations, and fit test forms. These documents shall only be valid one year from the date that they were taken. Expired certifications, evaluations, and fit tests shall not be permitted. Workers with expired documentation will not be permitted to work on this project.

R. A daily count of any containerized waste or dumpsters generated shall be maintained and reported to the Owner or their authorized representative(s).

S. All PCB-containing materials or project waste generated/abated on site shall be placed into appropriate waste containers as required by applicable regulations.

T. The Contractor is responsible for notifying the Owner/Owner's Representative a minimum of five (5) business days prior to waste pick up from site by a properly permitted transporter so the Owner can have personnel present to sign waste manifest documentation at the time of waste removal from site.

U. Upon completion of work shift, the Contractor shall coordinate storage of any waste containers utilized during that shift in a safe and secure location, approved by the Owner and Owner's Representatives.

V. Post-Abatement Submittals – The following submittals should be provided to the Owner and Environmental Consultant after the conclusion of abatement activities.

W. Copies of Worker Documentation for personnel that were on site and conducted removals.

X. Copies of all PCB exposure personal air monitoring that was conducted to satisfy OSHA 1910. 134 regarding personal protective equipment.

Y. Copies of all waste characterization sampling that was conducted.

Z. Copies of all waste transport and disposal documentation.

1.4 SCOPE OF WORK – GENERAL

A. The Contractor shall be responsible for the abatement and proper packaging and disposal of any PCB-containing materials as identified on HM Series Drawings.

B. The Contractor shall be responsible for complying with state, federal, local, and Owner requirements/regulations and job specifications pertaining to PCB abatement procedures. Whenever a conflict between regulations and/or specifications occurs, the most stringent requirement(s) shall apply.

C. The Contractor acknowledges that locations requiring PCB abatement may exist within asbestos regulated work areas.

PART 2 - PROJECT EXECUTION

2.1 Submittals

A. After the pre-abatement submittals have been approved by the Environmental Consultant, abatement activities may proceed, in accordance with the following:

2.2 Pre-Abatement Activities

A. The contractor shall utilize decontamination procedures to comply with OSHA. At a minimum, a wash station must be utilized that is deemed acceptable by the Environmental Consultant. A separate wash station shall be utilized for equipment. The Contractor shall create this decontamination unit to capture all wastewater. The Contractor shall be responsible for the proper handling & disposal of this wastewater. At no time, shall this wastewater be permitted to be disposed of in the ground or sanitary sewer.

B. After the decontamination unit is deemed satisfactory by the Environmental Consultant, the Contractor shall establish the regulated work area. This area shall comply with state and federal regulations, and shall include the following;

C. Barrier tape, or preferably orange construction fencing, shall be utilized to prevent unauthorized personnel from accessing the regulated work area. This area shall be extended 25 feet (if possible) in a horizontal direction from the furthest point of abatement.

D. Signage that complies with OSHA regulations shall be placed on the decontamination unit/area, any waste dumpsters, and at frequent intervals around the perimeter of the work area boundary.

E. The Contractor shall provide their personnel with personal protective equipment (PPE) to minimize employee exposure to PCBs. This PPE shall be provided to the Environmental Consultant, regulatory and/or any other authorized visitors upon demand.

F. Critical barriers shall be installed inside the building prior to abatement activities. These barriers shall be constructed of two (2) layers of 6-mil polyethylene sheeting and shall be secured in place utilizing tape and spray glue (or an approved equivalent). These barriers shall remain in place until the work areas have met visual clearance criteria and the Environmental Consultant grants permission for these barriers to be removed.

2.3 ABATEMENT ACTIVITIES - CONTRACTOR

A. Accumulations of PCB waste and/or water shall not be allowed. A high efficiency particulate air (HEPA) vacuum shall be utilized to immediately clean-up these deposits. The containerized waste in the HEPA vacuum shall be handled and disposed appropriately.

B. During gross removal activities, the PCB MATERIALS AND/OR PCB CONTAMINATED MATERIALS shall be immediately placed into approved containers, labeled accordingly, and secured.

C. The Contractor shall sufficiently abate all PCB-containing materials as required. Upon completion of abatement activities, the contractor shall clean the substrate in proximity to the areas where the PCB-containing materials were subject to abatement. This measure is required to clean any PCB oils or dusts that may be present on the substrate post abatement.

D. The Contractor is required to utilize following satisfactory final visual inspection and clearance sampling (if required), the contractor shall encapsulate the substrate with an epoxy/caulk application that is approved for the substrate, location and application by the manufacturer and architect

E. Upon sufficiently cleaning the component and satisfactory visual inspection performed by Environmental Consultant/Owner, the contractor acknowledges that the Owner and the Owner’s representative will utilize multiple means of clearance criteria, including but not limited to air sampling, wipe sampling, substrate testing. Ultimately, the Owner’s third party environmental consultant shall determine when work is complete.

2.4 WASTE REQUIREMENTS

A. All PCB-containing materials shall be disposed of by the Owner, at the Owner’s cost. The Contractor shall not include any costs associated with waste disposal in their bid. The waste containers shall be provided by the Owner. No waste shipments shall exit site, unless the Owner’s representative is present and directing such activities.

B. The Contractor is responsible for proper packing for transport and security while on site, prior to shipment.

2.5 CLOSE-OUT DOCUMENTATION

A. Full payment will be withheld until the Owner has received all necessary documentation to close out the project.

PART 3 - ENVIRONMENTAL CONSULTANT RESPONSIBILITIES

A. Environmental Consultant Responsibilities

B. At the Owner's discretion, the environmental consultant shall provide on-site oversight of the contractor during abatement activities to ensure compliance to regulatory laws & job specifications.

END OF SECTION 02 82 15

SECTION 028313 - LEAD-SAFE WORK PRACTICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. Lead-based paint (LBP), as defined by the U.S. Environmental Protection Agency (USEPA) and the U.S. Department of Housing and Urban Development (HUD), means painted or glazed materials (i.e. ceramic tile) containing 0.5% lead or more by weight.

B. Lead, as defined by OSHA 29 CFR Part 1926.62, means metallic lead, all inorganic lead compounds, and organic lead soaps. All other organic lead compounds are excluded from this definition.

C. Action Level, as defined by OSHA 29 CFR Part 1926.62, means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter (30 $\mu g/m^3$) of air calculated as an 8-hour time-weighted average (TWA).

D. Permissible Exposure Limit (PEL), as defined by OSHA 29 CFR Part 1926.62, means employee exposure, without regard to personal protective equipment, to an airborne concentration of lead of 50 $\mu g/m^3$ (calculated as a TWA).

E. Competent person, as defined by OSHA 29 CFR Part 1926.62, means one who is capable of identifying lead hazards and implementing corrective measures to eliminate hazards.

F. Lead-containing material (LCM) includes LBP, lead-containing components / surfaces, and glazed / ceramic tile applications. A building material is defined as an LCM if any detectable amount of lead is present in that building material.

1.03 SUMMARY OF WORK

Unless otherwise indicated, all painted surfaces and building materials are presumed to contain lead and shall be treated as LCM. Upon request, the Contractor may review available survey reports for additional details pertaining to LCMs identified at the site.

A. Activities that will disturb LCM shall comply with the conditions specified herein. The Occupational Safety & Health Administration (OSHA) regulates occupational exposure to lead under 29 CFR Part 1926.62, Lead in Construction Standard. Any Contractor disturbing LCM shall comply with all the requirements of 29 CFR Part 1926.62 and this specification. The intent is for the Contractor to protect their workers and building occupants from unnecessary exposures to lead.

B. The Contractor shall provide all labor, materials, tools, and equipment necessary to protect both workers and building occupants from potential lead exposure.

C. Any waste products shall be considered industrial or hazardous waste, based on the results of a Toxicity Characteristic Leaching Procedure (TCLP) testing (which will be conducted by the Contractor). The Contractor will be responsible for disposal by a NYSDEC permitted hauler and disposal at a NYSDEC permitted facility. Under no circumstances shall any project waste be transported to or disposed of on private property.

D. Exact quantities and locations of LCMs that will be disturbed shall be determined by the Contractor at the time of bidding. The Contractor must be satisfied as to the quantity of waste requiring removal, special handing and packaging and include all such costs in their bid price.

E. All work shall be performed in accordance with this specification and applicable federal, state, and/or local regulations. Dry sweeping of lead-containing dust is prohibited. Lead-containing debris shall be removed and collected using high efficiency particulate air (HEPA) vacuums designed to collect waste including paint chips, debris, and dust.

F. It is the Contractor's responsibility to ensure that waste materials are contained, in accordance with all applicable federal, state, and local regulations.

1.04 APPLICABLE REGULATIONS

A. The Contractor shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding the handling and storage of LCM. The Contractor is further responsible to conduct work in compliance with all applicable codes, rules, laws, and regulations including, but not limited to:

1. Worker Protection - Occupational Safety and Health Administration (OSHA)
    a. 29 CFR Part 1910.134 - Respiratory Protection Standard
    b. 29 CFR Part 1926. 20 - General Safety and Health Provisions
    c. 29 CFR Part 1926.59 - Hazard Communication
    d. 29 CFR Part 1926.62 - Lead Exposure in Construction
    e. 29 CFR Part 1910.94 and Part 1926. 57 – Ventilation
2. Ambient Air Quality - Environmental Protection Agency (EPA)
    a. 40 CFR Part 50.6 - National Primary and Secondary Ambient Air Quality Standards for Particulate Matter
3. Water Quality - Environmental Protection Agency (EPA)
    a. 40 CFR Part 122 - Administered Permit Programs; The National Pollutant Discharge Elimination System
4. Waste Disposal - Environmental Protection Agency (EPA)
    a. 40 CFR Part 261 - Identification and Listing of Hazardous Waste
    b. 40 CFR Part 262 - Standards Applicable to Generators of Hazardous Waste
    c. 40 CFR Part 263 - Standards Applicable to Transporters of Hazardous Waste
5. New York State Department of Environmental Conservation (NYSDEC)
    a. Title 6 Parts 360-7, 364, and 370 through 374

B. The Contractor shall comply with the following regulations and guidance documents:

1. U.S. Department of Labor

2. Occupational Safety and Health Administration Pub. 3126 - Working with Lead in the Construction Industry
3. USEPA Lead Renovation, Repair and Painting (RRP) Program

1.05 LEAD HAZARDS

A. Work practices / methods that may release lead dust or fumes into the air and onto surrounding surfaces are prohibited. It is the Contractor's responsibility to reduce potential exposure to lead.

B. Lead is a toxic substance, which travels into the body by inhalation or ingestion due to lead dust and/or fumes that are present. Upon entering the body, lead enters the bloodstream, traveling throughout the body. The body cannot eliminate all of the lead; therefore, it is stored in tissue and organs. Stored quantities of lead may cause irreversible damage to cells, organs, and body systems.

C. Exposure to lead may affect individuals differently. Exposure may occur without any indication of exposure or symptoms developing. Symptoms of lead poisoning to be aware of include, but are not limited to, loss of appetite, trouble sleeping, irritability, fatigue, headache, joint and muscle ache, metallic taste, decreased sex drive, lack of concentration, and moodiness.

D. Prolonged exposure may result in damage to the body's systems including nervous, reproductive and circulatory systems. Symptoms of such exposures may include, but are not limited to, stomach pains, high blood pressure, nausea, tremors, seizures, anemia, constipation, and convulsions.

E. The Contractor's Supervisor is responsible to monitor any workers for such symptoms and is further responsible for ensuring affected workers are removed from the area. Affected workers shall not return until such time that the requirements outlined in the OSHA Lead in Construction Standard (29 CFR Part 1926.62) have been met.

1.06 GENERAL REQUIREMENTS

a. The Contractor is responsible for complying with the following general requirements applicable to the project (at a minimum):
   1. Respiratory Protection and personal protection
   2. Medical examinations
   3. Utilization of engineering controls, as necessary, to reduce potential exposure.
   4. Proper clean up and disposal of all lead-related waste materials, as required.

b. The Contractor is solely responsible for properly protecting their workers. Additional safety measures beyond OSHA requirements are encouraged but are at the implementation and discretion of the Contractor.

1.07 SUBMITTALS

A. The following information shall be transmitted for review and approval, prior to starting the work:

1. Work Plan - The Contractor shall submit a work plan in compliance with the requirements of the OSHA Lead in Construction Standard (29 CFR Part 1926.62). The plan shall include but is not limited to handling, cleaning, containerizing, transport, and disposal.
2. Equipment - Information for all equipment utilized shall be submitted for review prior to commencement of project activities. This includes, but is not limited to, equipment specifications and safety data sheets (SDS).
3. Training - The Contractor shall provide proof of Lead Awareness training in accordance with OSHA 29 CFR Part 1926.62 for all employees performing renovation/repair activities resulting in disturbance of LCMs.
4. Disposal - The Contractor shall prepare all documentation, including all required permits, disposal facilities locations and permits, and transporter information. If applicable, copies of applicable laboratory credentials shall be provided for the laboratory performing TCLP analysis.

B. Post-Abatement / Closeout Submittals. The following information shall be transmitted for review and approval within 30 days following completion of the work:
1. Copies of all OSHA personal/employee lead exposure assessment air sampling data collected during the project.
2. Any other documentation requested by the Owner, Owner's Representative and Environmental Consultant.

1.08 PERSONAL AIR SAMPLING & ANALYSIS

A. The Contractor is responsible for conducting personal lead exposure assessment air monitoring of their employees, as required by OSHA 29 CFR Part 1926.62. Personal air samples shall be collected which are representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Full-shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

B. The Contractor shall provide laboratory analysis reports documenting the completion of personal lead exposure assessment air monitoring of employees working with lead, in accordance with OSHA 29 CFR Part 1926.62.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Solutions - A lead-specific cleaning solution shall be utilized for all cleaning activities. The cleaning solution shall be an approved solution that does not contain tri-sodium phosphate (TSP).

B. Plastic Sheeting - To prevent dust migration, dust barriers, containments, and/or enclosures shall be constructed utilizing 6-mil fire-retardant plastic sheeting. These barriers shall be constructed to minimize dust migration into adjacent non-work areas.

C. Framing - If framing is utilized for the construction of dust barriers/containments, all reinforcement framing/sheathing materials must be at least ⅜-inch thick. Minimum

requirements for framing materials shall be comprised of 2”x4” stud framing in accordance with all applicable building codes.

D. Adhesives - Commercially available tape and spray adhesives designed for such purposes to maintain the integrity of barriers, containments, and enclosures.

2.02 EQUIPMENT

A. Protective Clothing - Coveralls, gloves, eye protection, ear protection, safety footwear, hard hats, and fall protection are required as per all applicable OSHA regulations.

B. Respiratory Protection - The Contractor shall provide workers with adequate respiratory protection based on the lead hazards identified at the site. The level of respiratory protection shall be determined through personal exposure assessment air monitoring.

C. Respirator Filters - The Contractor shall provide their workers with appropriate respirator filters for the respiratory protection the workers are utilizing as per OSHA 29 CFR Part 1910.134.

PART 3 - EXECUTION

3.01 LEAD COMPLIANCE PLAN

A. The Contractor is required to establish and follow a lead compliance plan for the project. The requirements, as outlined in OSHA 29 CFR Part 1926.62, include written procedures for construction activities regarding control methods and engineering controls.

B. If the Contractor fails to follow their lead compliance plan, The Owner will engage the services of a third-party environmental consultant to observe and document the contractor’s work relative to lead.

3.02 SIGNAGE

A. Warning signs shall be posted where the potential for any lead exposure exists.

B. Signs shall remain in place until renovation/demolition activities have been completed, and the area cleaned.

C. All signage shall comply with OSHA 29 CFR Part 1926.62.

3.03 WORK METHODS

A. The Contractor shall select work methods in compliance with OSHA 29 CFR Part 1926.62. All work shall be performed utilizing wet methods and other engineering controls, as necessary.

B. The Contractor is prohibited from dry methods of removal, heat gun applications, mechanical methods (grinding/sanding), and/or torch-cutting during renovation / demolition activities.

3.04 CLEANING & CLEARANCE

A. Following the completion of all lead-related work activities, all surfaces within and 25 feet beyond the areas impacted by the work shall be cleaned of all visible paint chips, dust, and debris.

B. Visual examinations/inspections of all areas affected by the lead-related work shall be conducted by the Contractor's competent person to determine satisfactory cleaning of all affected areas; however, the Owner may retain a third-party consultant to perform visual clearance examinations/inspections and/or perform lead dust wipe sampling to determine satisfactory cleaning and satisfactory completion of the work.

C. If the Contractor does not satisfactorily clean an area based on visual examinations, or if lead dust-wipe sampling results are unacceptable, the affected areas shall be re-cleaned by the Contractor at their own expense. The cost for re-cleaning, third-party consultant oversight, and additional sampling / testing associated with re-cleaning activities shall be borne by the Contractor.

3.05 WASTE TRANSPORTATION & DISPOSAL

A. The Contractor is responsible for completing proper waste characterization sampling and laboratory analysis of LCM prior to disposal / removal from site. Waste materials include, but are not limited to personal protective equipment, plastic sheeting, signage, barrier tape, LBP components, LCM components, lead-contaminated materials, etc.

B. The Contractor is responsible for coordination with the Owner/Owner's representative(s) and the Owner's Third-Party Consultant for storage of waste containers at the site until laboratory waste characterization laboratory results are available for proper disposal.

C. Lead paint chips, lead paint debris, and lead baffle shall not be co-mingled with construction and demolition (C+D) debris. Failure to do so may result in the Contractor having to pay the associated fees for co-mingled lead waste disposal.

D. The Contractor is responsible for all costs associated with waste characterization and disposal.

END OF SECTION 02 83 13

SECTION 028314 – MISCELLANEOUS & SPECIAL WASTES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. The scope of work includes the handling, packaging, containerization, characterization, transportation, and disposal of all the miscellaneous hazardous / special wastes from the project site. In general, the miscellaneous hazardous / special wastes to be properly handled and disposed of on this project include but are not limited to sink traps, fluorescent light bulbs (mercury), fluorescent light ballasts (PCBs), and thermostats (mercury).

C. Due to the potential presence of hazardous wastes and/or regulated materials, these waste materials may not be disposed of as construction and demolition (C&D) debris. The Contractor shall comply with all applicable state, federal regulations (i.e., OSHA, NYSDEC, USEPA, etc.) and Syracuse University Policies regarding characterizing, handling, packaging, containerizing, transporting, and disposing of these wastes.

D. If any spills or releases of mercury, PCBs, petroleum, or any other hazardous or regulated material occurs, the Contractor shall notify the Owner and Owner's Representative immediately and take all necessary precautions and measures to contain and cleanup such spills or releases in accordance with all applicable regulations.

E. The Contractor shall ensure that their workers are properly trained and protected during all operations.

F. The Contractor is responsible for following all applicable federal, state, and local regulations. Failure to comply with regulations shall result in the Contractor having to pay for any legal fees, fines, cleanup costs, and/or other penalties associated with improper activities. If conflicts occur between any regulations and the project specifications, the Contractor is responsible for following the most stringent course of action.

1.02 SUBMITTALS

A. The Contractor shall provide the following submittals prior to conducting any work activities at the project site:

1. Proof of Training – In accordance with OSHA regulations, training must be provided to inform workers about the potential hazards associated with hazardous / special wastes prior to conducting operations at the project site. HAZMAT or HAZWOPER training certificates are recommended.
2. Waste Container Information – Contractor shall contact SUNY Cortland-Environmental Health & Safety to request and coordinate the waste containers utilized for all of the miscellaneous hazardous / special wastes requiring disposal during the course of this project.

1.03 OWNER'S REPRESENTATIVE

A. The Owner's Representative (third-party consultant) will oversee the Contractor during the handling of the hazardous / special wastes. The Owner's Representative (third-party consultant) will be responsible for the following tasks:
   1. Keeping a daily project log of the Contractor's activities on-site.
   2. Providing oversight of the Contractor.
   3. Notifying the Owner if any damaged, leaking, or broken light ballasts, tubes, bulbs, batteries, or thermostats are present.
   4. Recording the daily hazardous / special waste count, as provided by the Contractor.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Contractor shall package and containerize waste products for disposal in accordance with applicable regulations.

B. Raw vermiculite insulation shall not be utilized to package miscellaneous hazardous / special wastes, unless the Contractor has sufficient documentation to verify that the vermiculite insulation is asbestos-free. The documentation must be provided directly by the manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall be responsible for removal, packaging, containerization, and disposal of all miscellaneous hazardous and/or special wastes identified with the project scope.

B. The Contractor shall provide all labor, materials, tools, equipment, and personal protective equipment (PPE) necessary to remove and dispose of all of the hazardous materials/special wastes from the project site.

C. The Contractor shall notify SUNY Cortland Environmental Health & Safety staff a minimum of seventy-two hours (72) hours prior to the removal of waste from site. SUNY Cortland EH&S shall be present for all waste pick up and signing waste manifest documentation associated with the project. Under no circumstances shall any other party sign waste manifest documentation on behalf of SUNY Cortland.

3.02 CLOSE-OUT DOCUMENTATION

A. The Contractor shall provide the Owner's Representative with quantities of all hazardous / special wastes removed on a daily basis. This shall include a final summary at the conclusion of the project.

B. The Contractor shall provide the Owner / Owner's Representative with all pertinent waste documentation and manifests for the hazardous / special wastes removed and disposed of as part of this project. Original waste manifests and/or waste documentation shall be returned to the Owner within thirty-five (35) days of the waste(s) exiting the project site.

END OF SECTION 02 83 14

SECTION 03 01 30 - MAINTENANCE OF CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Bonding agents.
   2. Patching mortar.
   3. Epoxy crack-injection materials.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to concrete work, including, but not limited to, the following:
      a. Verify concrete-maintenance specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
      b. Concrete restoration specialist.
      c. Materials, material application, sequencing, tolerances, and required clearances.
      d. Shoring and bracing.
      e. Quality-control program.
      f. Coordination with building occupants.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.
      a. Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, project application types consisting of horizontal, vertical or overhead locations and application instructions.

B. Samples for Verification: Cured Samples for each exposed product and for texture specified.
   1. Include Samples of each required type, and texture of patching material in the form of patches in drilled holes or sawed joints in sample concrete representative of the range of concrete texture on the building.
   2. Include Samples of epoxy crack-injection adhesive in the form of injection-treated, whole, dense concrete block or brick units representative of the range of required adhesive colors.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For concrete-maintenance specialist and manufacturers.

B. Product Test Reports: For each manufactured bonding agent, cementitious patching mortar, and crack-injection adhesive, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Field quality-control reports.

D. Quality-Control Program: Submit before work begins.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Each manufactured bonding-agent, packaged patching-mortar, and crack-injection-adhesive manufacturer must employ factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.

B. Concrete-Maintenance Specialist Qualifications: Engage an experienced concrete-maintenance firm that employs installers and supervisors who are trained and approved by manufacturer to apply packaged patching-mortar and crack-injection adhesive when performing the Work of this Section. Firm must have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing or patching new concrete is insufficient experience for concrete-maintenance work.

C. Quality-Control Program: Prepare a written plan for concrete maintenance to systematically demonstrate the ability of personnel to properly perform maintenance work, including each phase or process, protection of surrounding materials during operations, and control of debris and runoff during the Work. Describe in detail materials, methods, equipment, and sequence of operations to be used for each phase of the Work.

1.6 MOCKUPS

A. Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Concrete Removal and Patching Mockup: Remove and repair an approximately 48 sq. in. area of deteriorated concrete.
   2. Epoxy Crack Injection Mockup: Perform epoxy crack-injection material in two separate areas , each approximately 48 inches long.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

B. Store cementitious materials off the ground, under cover, and in a dry location.

1.8 FIELD CONDITIONS

A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

B. Cold-Weather Requirements for Cementitious Materials:
   1. Do not apply unless concrete surface and air temperatures are above 40 deg F and will remain so for at least 48 hours after completion of Work.
   2. Comply with the following procedures:
      a. When air temperature is below 40 deg F, heat patching-material ingredients and existing concrete to produce temperatures between 40 and 90 deg F.
      b. When mean daily air temperature is between 25 and 40 deg F, cover completed Work with weather-resistant insulating blankets for 48 hours after repair or provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 48 hours after repair.
      c. When mean daily air temperature is below 25 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 48 hours after repair.

C. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. ChemMasters.
   2. Sika Corporation.
   3. W. R. MEADOWS.

2.2 SOURCE LIMITATIONS

A. For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

2.3 BONDING AGENTS

A. Latex Bonding Agent, Nonredispersible: Type II, ASTM C1059/C1059M for use at structural and exterior locations.

2.4 PATCHING MORTAR

A. Patching Mortar Requirements:
   1. Only use patching mortars that are recommended by manufacturer for each applicable horizontal, vertical, or overhead use orientation.
   2. Texture: Provide patching mortar and aggregates sizes necessary to produce patching mortar that matches existing, adjacent, and exposed concrete. Blend several aggregates if necessary to achieve suitable matches.

B. Rapid-Strengthening, Cementitious Patching Mortar: ASTM C928/C928M packaged, dry mix for repair of concrete.
   1. Compressive Strength: Not less than 4000 psi within three hours when tested in accordance with ASTM C109/C109M.

C. Polymer-Modified, Cementitious Patching Mortar: Packaged, dry mix for repair of concrete and that contains a nonredispersible latex additive as either a dry powder or a separate liquid that is added during mixing.
   1. Compressive Strength: Not less than 4000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.5 EPOXY CRACK-INJECTION MATERIALS

A. Epoxy Crack-Injection Adhesive: ASTM C881/C881M, bonding system Type I, free of VOCs.

2.6 MISCELLANEOUS MATERIALS

A. Formwork Materials: Form-facing materials must comply with ACI 301 requirements.

B. Water: Potable.

2.7 MIXES

A. General: Mix products, in clean containers, in accordance with manufacturer's written instructions.
   1. Do not add water, thinners, or additives unless recommended by manufacturer.
   2. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
   3. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

PART 3 - EXECUTION

3.1 CONCRETE MAINTENANCE

A. Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.

B. Comply with manufacturers' written instructions for surface preparation and product application.

3.2 EXAMINATION

A. Notify Architect seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.

B. Locate areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries. At columns and walls, make boundaries level and plumb unless otherwise indicated.

C. Perform surveys as the Work progresses to detect hazards resulting from concrete-maintenance work.

3.3 PREPARATION

A. Ensure that supervisory personnel are on-site and on duty when concrete-maintenance work begins and during its progress.

B. Protect persons, motor vehicles, surrounding surfaces of building being repaired, building site, plants, and surrounding buildings from harm resulting from concrete-maintenance work.
   1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
   2. Use only proven protection methods appropriate to each area and surface being protected.
   3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete-maintenance work is being performed.
   4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of concrete-maintenance work.
   5. Contain dust and debris generated by concrete-maintenance work and prevent it from reaching the public or adjacent surfaces.
   6. Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.
   7. Protect floors and other surfaces along haul routes from damage, wear, and staining.

8. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.
9. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
10. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
11. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete-maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
1. Verify that affected utilities have been disconnected and capped.
2. Inventory and record the condition of items to be removed for reinstallation or salvage.

3.4 REMOVAL OF CONCRETE

A. Do not overload structural elements with debris.

B. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch. Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.

C. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement.

D. Remove additional concrete if necessary to provide a depth of removal of at least 1/2 inch over entire removal area.

E. Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar and to provide at least 3/4-inch clearance around bar.

F. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound and disbonded concrete is completely removed.

G. Provide surfaces with a fractured profile of at least 1/8 inch that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level unless otherwise directed.

H. Thoroughly clean removal areas of loose concrete, dust, and debris.

3.5 APPLICATION OF BONDING AGENTS

A. Latex Bonding Agent, Type I: Apply to concrete by brush roller or spray. Allow to dry before placing patching mortar or concrete.

B. Latex Bonding Agent, Type II: Mix with portland cement and scrub into concrete surface in accordance with manufacturer's written instructions. Place patching mortar or concrete while bonding agent is still wet. If bonding agent dries, recoat before placing patching mortar or concrete.

3.6 INSTALLATION OF PATCHING MORTAR

A. Place patching mortar as specified in this article unless otherwise recommended in writing by manufacturer.
   1. Provide forms where necessary to confine patch to required shape.
   2. Wet substrate and forms thoroughly and then remove standing water.

B. Pretreatment: Apply specified bonding agent.

C. General Placement: Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.

D. Vertical Patching: Place material in lifts of not more than 1 inch or less than 1/4 inch. Do not feather edge.

E. Overhead Patching: Place material in lifts of not more than 1 inch or less than 1/4 inch. Do not feather edge.

F. Consolidation: After each lift is placed, consolidate material and screed surface.

G. Multiple Lifts: Where multiple lifts are used, score surface of lifts to provide a rough surface for placing subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.

H. Finishing: Allow surfaces of lifts that are to remain exposed to become firm and then finish to a surface matching adjacent concrete.

I. Curing: Wet-cure cementitious patching materials, including polymer-modified cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.

3.7 APPLICATION OF EPOXY CRACK-INJECTION MATERIALS

A. Clean cracks with oil-free compressed air or low-pressure water to remove loose particles.

B. Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.

C. Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch thick by 1 inch wider than crack.

D. Inject cracks wider than 0.003 inch to a depth of 8 inches.

E. Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.

F. After epoxy adhesive has set, remove injection ports and grind surfaces smooth.

3.8 FIELD QUALITY CONTROL

A. Manufacturers Field Service: Engage manufacturers' factory-authorized service representatives for consultation and Project-site inspection and to provide on-site assistance when requested by Architect.
   1. Have manufacturers' factory-authorized service representatives perform the following number of Project-site inspections to observe progress and quality of the Work, distributed over the period of product installation, regardless of on-site assistance requested by Architect:
      a. Bonding-Agent and Packaged Patching-Mortar Installation: Three inspections.
      b. Crack-Injection-Adhesive Preparation and Installation: Four inspections.

B. Prepare inspection reports.

END OF SECTION 03 01 30

SECTION 03 01 30.51 – CLEANING OF CONCRETE SURFACES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cleaning the following:
   1. Cleaning of interior and exterior concrete surfaces.
   2. Removal of plant growth from exterior concrete surfaces.

1.2 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi.

B. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

C. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

D. High-Pressure Spray: 800 to 1200 psi; 4 to 6 gpm.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to cleaning concrete including, but not limited to, the following:
      a. Verify cleaning equipment and facilities needed to make progress and avoid delays.
      b. Materials, material application, and sequencing.
      c. Cleaning program.
      d. Coordination with building occupants.

1.4 SEQUENCING AND SCHEDULING

A. Work Sequence: Perform concrete cleaning work in the following sequence:
   1. Remove plant growth.
   2. Inspect for cracks and open joints. Where repairs are required, delay further cleaning work until after repairs are completed, cured, and dried to prevent the intrusion of water and other cleaning materials into the wall.
   3. Clean concrete surfaces.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include material descriptions and application instructions.
   2. Include test data substantiating that products comply with requirements.

1.6 QUALITY ASSURANCE

A. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing cleaners that have been used for similar applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.

B. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Include provisions for supervising worker performance and preventing damage.
   1. If materials and methods other than those indicated are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.

C. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Cleaning: Clean an area approximately 25 sq. ft. for each type of concrete surface condition.
      a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
      b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit concrete cleaning work to be performed according to product manufacturers' written instructions and specified requirements.

B. Clean concrete surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least seven days after completion of cleaning.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS - GENERAL

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

2.2 INTERIOR CLEANING MATERIALS

A. Mild alkaline product for cleaning and degreasing light-to-heavily soiled masonry and concrete. Product contains no harsh acids, caustics or solvents.
   1. Product/Manufacturer: Basis of design.
      a. Enviro Klean 2010 All Surface Cleaner; PROSOCO, Inc.

2.3 EXTERIOR CLEANING MATERIALS

A. Mold, Mildew, and Algae Remover, Job Mixed: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.

B. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including concrete polished stone, brick, aluminum, plastics, and wood.
   1. Product/Manufacturer: Basis of design.
      a. Sure Klean Light Duty Concrete Cleaner; PROSOCO, Inc.

C. Acidic Cleaner: Manufacturer's standard acidic cleaner composed of acids, detergents, wetting agents, and inhibitors.
   1. Product/Manufacturer: Basis of design.
      a. Sure Klean Heavy Duty Concrete Cleaner; PROSOCO, Inc.

2.4 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, masonry, and polished stone surfaces from damaging effects of acidic and alkaline cleaners.

2.5 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended in writing by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
   1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents according to manufacturer's written instructions. Do not apply liquid

strippable masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.

2. Do not apply chemical solutions during winds of enough force to spread them to unprotected surfaces.
3. Neutralize alkaline and acid wastes before disposal.
4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

B. Remove downspouts and associated hardware adjacent to immediate work area and store during cleaning. Reinstall when cleaning is complete.
   1. Provide temporary rain drainage during work to direct water away from building.

3.2 CLEANING CONCRETE, GENERAL

A. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

B. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.

C. Use only those cleaning methods indicated for each concrete material and location.
   1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
   2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.
      a. Equip units with pressure gages.
      b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
      c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
      d. For high-pressure water-spray application, use fan-shaped spray that disperses water at an angle of at least 40 degrees.
      e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.

E. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the “Cleaning Appearance Standard” Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.

F. Water Application Methods:
   1. Water-Soak Application: Soak concrete surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
   2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from concrete surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

G. Chemical-Cleaner Application Methods: Apply chemical cleaners to concrete surfaces according to chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.

H. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
   1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

I. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.3 PRELIMINARY CLEANING

A. Removing Plant Growth: Completely remove visible plant, moss, vines, and shrub growth from concrete surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing remaining growth to dry as long as possible before removal. Remove loose soil and plant debris from open joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to planned cleaning methods. Extraneous substances include paint, calking, asphalt, and tar.
   1. Carefully remove heavy accumulations of rigid materials from concrete surface with sharp chisel. Do not scratch or chip surface.

3.4 CLEANING CONCRETE

A. Cold-Water Wash: Use cold water applied by low-pressure spray.

B. Hot-Water Wash: Use hot water applied by low-pressure spray.

C. Cleaning, General:
   1. Wet surface with cold water applied by low-pressure spray.

2. Scrub surface with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.
3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

D. Mold, Mildew, and Algae Removal:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
3. Scrub surface with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that surface remains wet.
4. Rinse with cold water applied by low-pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

E. Nonacidic Liquid Chemical Cleaning:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply cleaner to surface in two applications by brush or low-pressure spray.
3. Let cleaner remain on surface for period recommended in writing by chemical-cleaner manufacturer.
4. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

F. Mild-Acid Chemical Cleaning:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply cleaner to surface in two applications by brush or low-pressure spray.
3. Let cleaner remain on surface for period recommended in writing by chemical-cleaner manufacturer.
4. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

G. Acidic Chemical Cleaning:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply cleaner to surface in two applications by brush or low-pressure spray.
3. Let cleaner remain on surface for period recommended in writing by chemical-cleaner manufacturer.

4. Rinse with cold water applied by low-pressure spray to remove chemicals and soil. Rinse until all foaming, if any, stops and suds disappear.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage chemical-cleaner manufacturer's factory-authorized service representatives for consultation and Project-site inspection and provide on-site assistance when requested by Architect. Have chemical-cleaner manufacturer's factory-authorized service representatives visit Project site not less than twice to observing progress and quality of the work.

3.6 FINAL CLEANING

A. Clean adjacent surfaces of spillage and debris. Use detergent and soft brushes or cloths.

B. Remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

C. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 03 01 30.51

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SECTION 03 10 00 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Form-facing material for cast-in-place concrete.
   2. Geofoam.
   3. Waterstops.
   4. Shoring, bracing, and anchoring.

1.2 DEFINITIONS

A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.

B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following:
   1. Exposed surface form-facing material.
   2. Concealed surface form-facing material.
   3. Geofoam.
   4. Waterstops.

B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.
   1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
   2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301.
      a. Location of construction joints is subject to approval of the Architect.
   3. Indicate location of waterstops.
   4. Indicate proposed schedule and sequence of stripping of forms, shoring removal, and reshoring installation and removal.
   5. Indicate layout of insulating concrete forms, dimensions, course heights, form types, and details.

C. Samples:
   1. For waterstops.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Form Liners: Store form liners under cover to protect from sunlight.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
   1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
   2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.

2.2 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:
   1. Provide continuous, true, and smooth concrete surfaces.
   2. Furnish in largest practicable sizes to minimize number of joints.
   3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 03 30 00 "Cast-In-Place Concrete, and as follows:
      a. Plywood, metal, or other approved panel materials.

B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.
   1. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Liners:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Architectural Polymers, Inc.
      b. Fitzgerald Formliners
      c. Sika Corporation
      d. Spec Formliners, Inc.
   2. Product/Manufacturer: Basis of Design.
      a. #16293 Barn Wood; Fitzgerald Formliners.
   3. Size and direction: 1x6 board pattern, vertical orientation.
   4. Face Pattern: Wood.

2.3 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
   1. Products: Subject to compliance with requirements, provide one of the following:

a. Henry a Carlisle Company; MiraStop BW.
b. CETCO, a Minerals Technologies company; Waterstop-RX-101.
c. Sika Corporation; Swellstop.

2.4 GEOFOAM

A. Molded-Polystyrene Board Insulation: ASTM C578, Type I, 0.90-lb/cu. ft. density, 10-psi compressive strength.

2.5 RELATED MATERIALS

A. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
2. Form release agent for form liners shall be acceptable to form liner manufacturer.

B. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

PART 3 - EXECUTION

3.1 INSTALLATION OF FORMWORK

A. Comply with ACI 301.

B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 and to comply with the Surface Finish designations specified in Section 03 30 00 "Cast-In-Place Concrete" for as-cast finishes.

C. Limit concrete surface irregularities as follows:
1. Surface Finish-2.0: ACI 117 Class B, 1/4 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.
1. Minimize joints.
2. Exposed Concrete: Symmetrically align joints in forms.

E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
3. Install keyways, reglets, recesses, and other accessories, for easy removal.

F. Do not use rust-stained, steel, form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
1. Provide and secure units to support screed strips
2. Use strike-off templates or compacting-type screeds.

H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
2. Locate temporary openings in forms at inconspicuous locations.

I. Chamfer exterior corners and edges of permanently exposed concrete.

J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches.

K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

L. Construction and Movement Joints:
1. Construct joints true to line with faces perpendicular to surface plane of concrete.
2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
3. Place joints perpendicular to main reinforcement.
4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
    a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings.
    a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.

2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.

N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

Q. Form liner shall be installed to extend below the final grade line, ensuring no smooth concrete transitions are visible upon completion of backfill and landscaping.

3.2 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
3. Clean embedded items immediately prior to concrete placement.

3.3 GEOFOAM FILL

A. Install and level geofoam blocks in layers with abutting edges and ends and with the long dimension of each block at right angles to blocks in each subsequent layer. Offset joints of blocks in successive layers.

B. Install geofoam connectors at each layer of geofoam to resist horizontal displacement according to geofoam manufacturer's written instructions.

3.4 REMOVING AND REUSING FORMS

A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work.
   1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
   2. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
   1. Align and secure joints to avoid offsets.
   2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.5 SHORING AND RESHORING INSTALLATION

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
   1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
   1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 03 10 00

SECTION 03 20 00 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Steel reinforcement bars.
   2. Welded-wire reinforcement.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Each type of steel reinforcement.
   2. Bar supports.

B. Sustainable Design Submittals:
   1. Report steel reinforcement quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in steel reinforcement. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.

C. Shop Drawings: Comply with ACI SP-066:
   1. Include placing drawings that detail fabrication, bending, and placement.
   2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
   3. Show elevations of reinforced walls and other structural elements to clarify placement of reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
   1. Location of construction joints is subject to approval of Architect.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.
   1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M.

B. Material Test Reports: For the following, from a qualified testing agency:
   1. Steel Reinforcement:
      a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
   1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.

C. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.2 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
   1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
      a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:
   1. Do not cut or puncture vapor retarder.
   2. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.
   1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
   2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.
   1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
   2. Stagger splices in accordance with ACI 318.

G. Install welded-wire reinforcement in longest practicable lengths.
   1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
      a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 36 inches.
   2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
   3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
   4. Lace overlaps with wire.

3.3 JOINTS

A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement.
   2. Continue reinforcement across construction joints unless otherwise indicated.
   3. Do not continue reinforcement through sides of strip placements of floors and slabs.

B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
1. Steel-reinforcement placement.

END OF SECTION 03 20 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete standards.
2. Concrete materials.
3. Admixtures.
4. Vapor retarders.
5. Liquid floor treatments.
6. Curing materials.
7. Accessories.
8. Concrete mixture materials.
9. Concrete mixture class types.
10. Concrete mixing.

B. Related Requirements:
1. Section 03 10 00 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:
1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data:
1. Portland cement.
2. Blended hydraulic cement.
3. Fly ash.
4. Natural or other pozzolans.
5. Aggregates.
6. Admixtures:
a. Include limitations of use. Admixtures that do not comply with reference ASTM International requirements must be submitted with test data for approval.
7. Vapor retarders.
8. Liquid floor treatments.

9. Curing materials.
10. Joint fillers.

B. Sustainable Design Submittals:
1. Report concrete quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in concrete materials. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.

C. Design Mixtures: For each concrete mixture, include the following:
1. Mixture identification.
2. Compressive strength at 28 days or other age as specified.
3. Compressive strength required at stages of construction.
4. Durability exposure classes for Exposure Categories F, S, W, and C.
5. Maximum w/cm ratio.
6. Calculated equilibrium and fresh density for lightweight concrete.
7. Slump or slump flow limit.
8. Air content.
9. Nominal maximum aggregate size.
10. Intended placement method.
11. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.

D. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
a. Location of construction joints is subject to approval of the Architect.

E. Concrete Schedule: For each location of each class of concrete indicated in "Concrete Mixture Class Types" Article, including the following:
1. Concrete class designation.
2. Location within Project.
3. Exposure class designation.
4. Formed surface finish designation and final finish.
5. Final finish for floors.
6. Floor treatment, if any.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:
1. Installer: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following:
1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.

7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.

C. Material Test Reports: For the following:
1. Portland cement.
2. Blended hydraulic cement.
3. Fly ash.
4. Natural or other pozzolans.
5. Aggregates.
6. Admixtures.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.

E. Research Reports:
1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

F. Preconstruction Test Reports: For each mix design.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.
1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
1. Manufacturer's production facilities and delivery vehicles certified in accordance with NRMCA's certification requirements or equivalent approval by a State DOT.

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Level 1. Testing agency laboratory supervisor tests to be an ACI-certified Concrete Laboratory Testing Technician, Level 2.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 as follows:
1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When air temperature has fallen to, or is expected to fall below 40 deg F during the protection period, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE STANDARDS

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:
1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:
1. Portland Cement: ASTM C150/C150M, Type I, gray.
2. Blended Hydraulic Cement: ASTM C595/C595M, Type IL, portland-limestone cement.
3. Pozzolans: ASTM C618, Class C, or F.

C. Normal-Weight Aggregates:
   1. Coarse Aggregate: ASTM C33/C33M, Class 3S
   2. Fine Aggregate: ASTM C33/C33M.

2.3 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
   2. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
   3. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.

C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.4 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, except with maximum water-vapor permeance of 0.01. Include manufacturer's recommended thickness and adhesive or pressure-sensitive tape.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Layfield; VaporFlex 15 Mil.
      b. Reef Industries, Inc; Vaporguard.
      c. Stego Industries, LLC; Stego Wrap Vapor Barrier (15-Mil).

B. Vapor Retarder Accessories:
   1. Provide manufacturers standard seam tape, perimeter/terminated edge seal mastics tapes and termination bar, to provide a continuous vapor retarder complying with vapor permeance requirement.

2.5 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Dayton Superior; Pentra-Hard Densifier.
      b. Euclid Chemical Company (The); an RPM company; Euco Diamond Hard.
      c. Laticrete International, Inc.; L&M Seal Hard.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Dayton Superior; AquaFilm Concentrate J74.
      b. Euclid Chemical Company (The); an RPM company; Eucobar.
      c. Laticrete International, Inc.; L&M E-CON.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
   1. Color:
      a. Ambient Temperature Below 50 deg F (10 deg C): Black.
      b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
      c. Ambient Temperature Above 85 deg F (29 deg C): White.

D. Water: Potable water that does not cause staining of the surface.

2.7 ACCESSORIES

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 in accordance with ASTM D2240.

C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.8 CONCRETE MIXTURE MATERIALS

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
   1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:
   1. Fly Ash or Other Pozzolans: 25 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

2.9 CONCRETE MIXTURE CLASS TYPES

A. Normal-weight concrete used for footings, foundation walls, grade beams, and tie beams.
   1. Exposure Class: ACI 318 F2.
   2. Minimum Compressive Strength: 4500 psi at 28 days.
   3. Maximum w/cm: 0.45.
   4. Coarse Aggregate Gradation: Size 57, ASTM C33.
   5. Slump Limit: 4 inches, plus or minus 1 inch.
   6. Air Content:
      a. 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.

B. Normal-weight concrete used for interior slabs-on-ground.
   1. Exposure Class: ACI 318 F0.
   2. Minimum Compressive Strength: 3000 psi at 28 days.
   3. Maximum w/cm: 0.50.
   4. Minimum Cementitious Materials Content: 540 lb/cu. yd.
   5. Coarse Aggregate Gradation: Size 67, ASTM C33.
   6. Slump Limit: 4 inches, plus or minus 1 inch.
   7. Air Content:
      a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.

C. Structural lightweight concrete used for interior suspended slabs.
   1. Exposure Class: ACI 318 F0.
   2. Minimum Compressive Strength: 3000 psi at 28 days.
   3. Calculated Equilibrium Unit Weight: 110 lb/cu. ft., plus or minus 3 lb/cu. ft. as determined by ASTM C567/C567M.
   4. Maximum w/cm: 0.50.
   5. Coarse Aggregate Gradation: ¾-inch, ASTM C330.
   6. Slump Limit: 4 inches, plus or minus 1 inch.
   7. Air Content: 4 to 7 percent.

D. Normal-weight concrete used for interior metal pan stairs and landings:
   1. Exposure Class: ACI 318 F0.
   2. Minimum Compressive Strength: 3500 psi at 28 days.
   3. Maximum w/cm: 0.53.
   4. Minimum Cementitious Materials Content: 470 lb/cu. yd.
   5. Maximum Size Aggregate: 3/8 inch.
   6. Slump Limit: 3 inches, plus 1 inch or minus 2 inches.

7. Retarding Admixture: Not allowed.
8. Accelerating Admixture: Not allowed.

E. Normal-weight concrete used for exterior retaining walls.
1. Exposure Class: ACI 318 F2.
2. Minimum Compressive Strength: 4500 psi at 28 days.
3. Maximum w/cm: 0.45.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content:
a. Exposure Class F2: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.

F. Normal-weight concrete used for exterior slabs.
1. Exposure Class: ACI 318 F3.
2. Minimum Compressive Strength: 5000 psi at 28 days.
3. Maximum w/cm: 0.40.
4. Slump Limit: 4 inches, plus or minus 1 inch.
5. Air Content: 6 percent.
6. Maximum Percent of Fly Ash (of total cementitious materials): 25 percent.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 TOLERANCES

A. Comply with ACI 117.

3.4 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
   1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install reglets to receive waterproofing and through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.5 INSTALLATION OF VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
   1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
   2. Face laps away from exposed direction of concrete pour.
   3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
   4. Lap joints 6 inches and seal with manufacturer's recommended tape.
   5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
   6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
   7. Protect vapor retarder during placement of reinforcement and concrete.
      a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides and sealing to vapor retarder.

3.6 INSTALLATION OF CAST-IN-PLACE CONCRETE

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
   1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
   2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
   1. If a section cannot be placed continuously, provide construction joints as indicated.
   2. Deposit concrete to avoid segregation.
   3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
   4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
      a. Do not use vibrators to transport concrete inside forms.
      b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
      c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
      d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Do not place concrete floors and slabs in a checkerboard sequence.
   2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   3. Maintain reinforcement in position on chairs during concrete placement.
   4. Screed slab surfaces with a straightedge and strike off to correct elevations.
   5. Level concrete, cut high areas, and fill low areas.
   6. Slope surfaces uniformly to drains where required.
   7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
   8. Do not further disturb slab surfaces before starting finishing operations.

3.7 INSTALLATION OF JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
   1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
   2. Place joints perpendicular to main reinforcement.
      a. Continue reinforcement across construction joints unless otherwise indicated.
   3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
   4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Ground: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.8 APPLICATION OF FINISHING FLOORS AND SLABS

A. Float Finish:
1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

B. Trowel Finish:
   1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
   2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
   3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
   5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
   6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
   7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:
      a. Slabs on Ground:
         1) Specified overall values of flatness, F_F 35; and of levelness, F_L 25; with minimum local values of flatness, F_F 24; and of levelness, F_L 17.
      b. Suspended Slabs:
         1) Specified overall values of flatness, F_F 35; and of levelness, F_L 20; with minimum local values of flatness, F_F 24; and of levelness, F_L 15.

C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
   2. Coordinate required final finish with Architect before application.

3.9 APPLICATION OF FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:
   1. ACI 301 (ACI 301M) Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
      a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
      b. Remove projections larger than 1 inch.
      c. Tie holes do not require patching.
      d. Surface Tolerance: ACI 117, Class D.
      e. Apply to concrete surfaces for metal lap pan deck formed surfaces and those surfaces that are buried or covered with subsequent installed surfaces.
   2. ACI 301 (ACI 301M) Surface Finish SF-3.0:
      a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
      b. Remove projections larger than 1/8 inch.
      c. Patch tie holes.
      d. Surface Tolerance: ACI 117 Class A.

e. Locations: Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

B. Rubbed Finish: Apply the following to as-cast surface finishes where indicated on Drawings:
1. Smooth-Rubbed Finish:
a. Perform no later than one day after form removal.
b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.

3.10 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling in:
1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items.
1. Cast-in inserts and accessories, as shown on Drawings.
2. Screed, tamp, and trowel finish concrete surfaces.

3.11 APPLICATION OF CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
   1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
   2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
   3. If forms remain during curing period, moist cure after loosening forms.
   4. If removing forms before end of curing period, continue curing for remainder of curing period as follows:
      a. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
      b. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
   1. Begin curing after finishing concrete.
   2. Interior Concrete Floors:
      a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
         1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
         2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
            a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
            b) Cure for not less than seven days.
      b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
         1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
            a) Lap edges and ends of absorptive cover not less than 12 inches.
            b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
         2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3.12 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
   1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
   2. Do not apply to concrete that is less than seven days' old.
   3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
   4. Rinse with water; remove excess material until surface is dry.
   5. Apply a second coat in a similar manner if surface has received a float finish or abrasive surface preparation.

3.13 INSTALLATION OF JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
   1. Defer joint filling until concrete has aged at least six month(s).

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.14 INSTALLATION OF CONCRETE SURFACE REPAIRS

A. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

B. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
      a. Limit cut depth to 3/4 inch.
      b. Make edges of cuts perpendicular to concrete surface.
      c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
      d. Fill and compact with patching mortar before bonding agent has dried.

e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
   a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
   b. Compact mortar in place and match surrounding surface.
3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.

C. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
   a. Correct low and high areas.
   b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.
   a. Finish repaired areas to blend into adjacent concrete.
5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
   a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
   b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
   a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
   b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
   a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
   b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
   c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
   d. Place, compact, and finish to blend with adjacent finished concrete.
   e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
    a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
    b. Dampen cleaned concrete surfaces and apply bonding agent.
    c. Place patching mortar before bonding agent has dried.
    d. Compact patching mortar and finish to match adjacent concrete.
    e. Keep patched area continuously moist for at least 72 hours.

D. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

E. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
    a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
        1) Project name.
        2) Name of testing agency.
        3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
        4) Name of concrete manufacturer.
        5) Date and time of inspection, sampling, and field testing.
        6) Date and time of concrete placement.
        7) Location in Work of concrete represented by samples.
        8) Date and time sample was obtained.
        9) Truck and batch ticket numbers.
        10) Design compressive strength at 28 days.
        11) Concrete mixture designation, proportions, and materials.
        12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.

13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.

C. Delivery Tickets: comply with ASTM C94/C94M.

D. Inspections:
1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 150 cu. yd. or fraction thereof.
a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:
a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
b. Perform additional tests as needed.
3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; ASTM C173/C173M volumetric method, for structural lightweight concrete.
a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M:
a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample when strength test specimens are cast.
5. Concrete Density: ASTM C138/C138M:
a. One test for each composite sample when strength test specimens are cast.
6. Compression Test Specimens: ASTM C31/C31M:
a. Cast and standard cure two sets of two 6 inches by 12-inches or 4-inch by 8-inch cylindrical specimens for each composite sample.
7. Compressive-Strength Tests: ASTM C39/C39M.

a. Test one set of two standard cured specimens at seven days and one set of two specimens at 28 days.
b. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests:
    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
        1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

3.16 PROTECTION

A. Protect concrete surfaces as follows:
1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION 03 30 00

SECTION 03 35 49 - CONCRETE STAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Staining of concrete to create color uniformity.

B. Related Sections: Refer to Section 03 01 30.51 – Cleaning of Concrete Surfaces.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review products, methods, and procedures related to staining concrete.
   2. Require representatives of each entity directly concerned with decorative concrete paving to attend, including the following:
      a. Contractor's superintendent.
      b. Concrete stain applicator.
      c. Manufacturer's representative of concrete stain products.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product requiring color selection.

C. Samples for Verification: For each type of exposed color indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For concrete stain applicator.

1.5 QUALITY ASSURANCE

A. Stain Applicator Qualifications: An employer of workers trained and approved by concrete stain manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Apply concrete stain to new and existing concrete surfaces in area directed by Architect of not less the 16 square feet.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Traffic Control: Maintain access for pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Butterfield Color.
2. Quikrete Companies.
3. Sika Corp.

2.2 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.3 STAIN MATERIALS

A. Reactive Stain: Acidic-based stain with wetting agents and high-grade, UV-stable metallic salts that react with calcium hydroxide in cured concrete to produce permanent, variegated, or translucent color effects.
1. Product/Manufacturer: Basis of design.
a. LITHOCHROME Chemstain Classic, Sika Corporation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and concrete stains indicated.

B. Protect adjacent construction from discoloration and spillage during application of stains.

3.3 STAINING

A. Newly placed concrete shall be at least 30 days old before staining.

B. Prepare surfaces according to manufacturer's written instructions.
   1. Refer to Section 03 01 30.51 – Cleaning of Concrete Surfaces.
   2. Test surfaces with droplets of water. If water beads and does not penetrate surface, or penetrates only in some areas, profile surfaces by grinding, sanding, or abrasive blasting. Retest and continue profiling surface until water droplets immediately darken and uniformly penetrate concrete surfaces.
   3. Apply acidic solution to dampened concrete surfaces, scrubbing with uncolored, acid-resistant nylon-bristle brushes until bubbling stops and concrete surface has texture of 120-grit sandpaper. Do not allow solution to dry on concrete surfaces. Rinse until water is clear. Control, collect, and legally dispose of runoff.

C. Allow concrete surface to dry before applying stain. Verify readiness of concrete to receive stain according to ASTM D4263 by tightly taping 18-by-18-inch, 4-mil- thick polyethylene sheet to a representative area of concrete surface. Apply stain only if no evidence of moisture has accumulated under sheet after 16 hours.

D. Reactive Stain: Apply reactive stain to concrete surfaces according to manufacturer's written instructions and as follows:
   1. Apply stain by uncolored bristle brush, roller, or high-volume, low-pressure sprayer and immediately scrub into concrete surface with uncolored, acid-resistant nylon-bristle brushes in continuous, circular motion. Do not spread stain after fizzing stops. Allow to dry four hours and repeat application of stain in sufficient quantity to obtain color consistent with approved mockup.
   2. Remove stain residue after four hours by wet scrubbing with commercial-grade detergent recommended by stain manufacturer. Rinse until water is clear. Control, collect, and legally dispose of runoff.

3.4 REPAIR AND PROTECTION

A. Protect stained concrete surfaces from damage.

B. Maintain stained concrete free of stains, discoloration, dirt, and other foreign material.

END OF SECTION 03 35 49

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SECTION 03 41 00 - PRECAST STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Precast structural concrete hollow-core slab units.
   2. Precast structural concrete stairs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each precast concrete mixture. Include compressive strength and, if required, water-absorption tests.

C. Shop Drawings:
   1. Include member locations, plans, elevations, dimensions, shapes and sections, openings, support conditions, and types of reinforcement, including special reinforcement.
   2. Detail fabrication and installation of precast structural concrete units, including connections at member ends and to adjoining construction.
   3. Indicate type, size, and length of welded connections by AWS standard symbols.
   4. Detail loose and cast-in hardware, lifting and erection inserts, connections, and joints.
   5. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
   6. Include and locate openings larger than 10 inches. Where additional structural support is required, include header design.
   7. Indicate location of each precast structural concrete unit by same identification mark placed on panel.
   8. Indicate relationship of precast structural concrete units to adjacent materials.
   9. Indicate estimated camber for precast floor slabs with concrete toppings.
   10. Indicate shim sizes and grouting sequence.
   11. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.

D. Delegated-Design Submittal: For precast structural concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Show precast structural concrete unit types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from precast structural concrete.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Welding certificates.

C. Material Certificates: For the following:
   1. Cementitious materials.
   2. Reinforcing materials and prestressing tendons.
   3. Admixtures.

D. Material Test Reports: For aggregates, by a qualified testing agency.

E. Preconstruction test reports.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering precast structural concrete units to comply with performance requirements. Responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
   1. Designated as a PCI-certified plant as follows:
      a. Group C, Category C2 - Prestressed Hollowcore and Repetitively Produced Products.

B. Installer Qualifications: A precast concrete erector qualified and designated by PCI's Certificate of Compliance, to erect Category S1 - Simple Structural Systems.

C. Quality-Control Standard: For manufacturing procedures, testing requirements, and quality-control recommendations for types of units required, comply with PCI MNL 116, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products."

D. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

1.6 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction before starting that Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Support units during shipment on nonstaining shock-absorbing material in same position as during storage.

B. Store units with adequate bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
   1. Store units with dunnage across full width of each bearing point unless otherwise indicated.
   2. Place adequate dunnage of even thickness between each unit.
   3. Place stored units so identification marks are clearly visible, and units can be inspected.

C. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.

D. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design precast structural concrete units.

B. Design Standards: Comply with ACI 318 and with design recommendations in PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of precast structural concrete units indicated.

C. Fire-Resistance Calculations: Where indicated, provide precast structural concrete units whose fire resistance meets prescriptive requirements of authorities having jurisdiction or has been calculated according to ACI 216.1 or PCI MNL 124, "Design for Fire Resistance of Precast Prestressed Concrete," and is acceptable to authorities having jurisdiction.

D. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.

E. Structural Performance: Provide precast structural concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:
   1. Dead Loads: As indicated on Drawings.

2. Design precast structural concrete framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements. Maintain precast structural concrete deflections within limits of ACI 318.
   a. Thermal Movements: Allow for in-plane thermal movements resulting from annual ambient temperature changes of minus 18 to plus 120 deg F.
3. Fire-Resistance Rating: Select material and minimum thicknesses to provide indicated fire rating.

2.2 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
   1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A706/A706M, deformed.

C. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.

D. Plain-Steel Welded Wire Reinforcement: ASTM A185/A185M, fabricated from as-drawn steel wire into flat sheets.

E. Deformed-Steel Welded Wire Reinforcement: ASTM A497/A497M or ASTM A1064/A1064M, flat sheet.

F. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 116.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type III, gray, unless otherwise indicated.

B. Supplementary Cementitious Materials:
   1. Fly Ash: ASTM C618, Class C or F, with maximum loss on ignition of 3 percent.

C. Normal-Weight Aggregates: Except as modified by PCI MNL 116, ASTM C33/C33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.

D. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.

E. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
1. Water-Reducing Admixtures: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing Admixture: ASTM C1017/C1017M, Type I.

2.5 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A572/A572M, Grade 50.

B. Carbon-Steel-Headed Studs: ASTM A108, Grade 1010 through 1020, cold finished, AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical properties of PCI MNL 116.

C. Carbon-Steel Plate: ASTM A572/A572M, Grade 50.

D. Shop-Primed Finish: Prepare surfaces of nongalvanized-steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3, and shop apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 according to SSPC-PA 1.

E. Welding Electrodes: Comply with AWS standards.

F. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install precast structural concrete units.

2.6 ACCESSORIES

A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install structural precast concrete units.

2.7 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C150/C150M, Type I, and clean, natural sand, ASTM C144 or ASTM C404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C1218/C1218M.

2.8 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.
   1. Limit use of fly ash to 20 percent replacement of portland cement by weight.

B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at precast structural concrete fabricator's option.

C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 116 when tested according to ASTM C1218/C1218M.

D. Normal-Weight Concrete Mixtures: Proportion full-depth mixture by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
   1. Compressive Strength (28 Days): 4500 psi.
   2. Maximum Water-Cementitious Materials Ratio: 0.42.

E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 116.

F. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

G. Concrete Mix Adjustments: Concrete mix design adjustments may be proposed if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant.

2.9 MOLD FABRICATION

A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.

B. Maintain molds to provide completed precast structural concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.

2.10 FABRICATION

A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing precast structural concrete units to supporting and adjacent construction.

C. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.

D. Reinforcement: Comply with recommendations in PCI MNL 116 for fabricating, placing, and supporting reinforcement.
   1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcement exceeds limits specified in ASTM A775/A775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
   2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
   3. Place reinforcing steel and prestressing strand to maintain at least 3/4-inch minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
   4. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Reinforce precast structural concrete units to resist handling, transportation, and erection stresses and specified in-place loads.

F. Comply with requirements in PCI MNL 116 and in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

G. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.

H. Thoroughly consolidate placed concrete by vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 116.

I. Comply with PCI MNL 116 procedures for hot- and cold-weather concrete placement.

J. Identify pickup points of precast structural concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each precast structural concrete unit on a surface that does not show in finished structure.

K. Cure concrete, according to requirements in PCI MNL 116, by moisture retention without heat or by accelerated heat curing using live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

L. Discard and replace precast structural concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 116 and meet Architect's approval.

2.11 FABRICATION TOLERANCES

A. Fabricate precast structural concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 116 product dimension tolerances as well as position tolerances for cast-in items.

2.12 HOLLOW-CORE SLAB UNITS

A. Type: Precast, concrete units with open, hollow cores running the full length of the slab units.

B. Furnish units free of voids and honeycombs.

C. Provide standard finish to precast concrete units.
   1. Where concrete topping is indicated, apply broom finish to top of hollow-core slab units.

D. Reinforce units to resist transportation and erection stresses.

E. Include cast-in weld plates where required.

F. Coordinate with other trades for installation of cast-in items.

G. Provide solid, monolithic, precast concrete slab units forming an integral part of hollow-core slab unit system. Design and fabricate solid units to dimensions and details indicated for hollow-core slab units.

H. Provide headers of cast-in-place concrete or structural-steel shapes for openings larger than one slab width according to hollow-core slab unit fabricator's written recommendations.

2.13 CONCRETE STAIRS

A. Type: Precast, concrete stairs.

B. Furnish units free of voids and honeycombs.

C. Provide standard finish to precast concrete stairs.

D. Reinforce units to resist transportation and erection stresses.

E. Include cast-in weld plates where required.

F. Coordinate with other trades for installation of cast-in items.

2.14 COMMERCIAL FINISHES

A. Commercial Grade: Remove fins and protrusions larger than 1/8 inch and fill holes larger than 1/2 inch. Rub or grind ragged edges. Faces must have true, well-defined surfaces. Air holes, water marks, and color variations are permitted. Limit form joint offsets to 3/16 inch.

B. Screed or float finish unformed surfaces. Strike off and consolidate concrete with vibrating screeds to a uniform finish. Hand screed at projections. Normal color variations, minor indentations, minor chips, and spalls are permitted. Major imperfections, honeycombing, or defects are not permitted.

C. Smooth, steel trowel finish unformed surfaces. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.

D. Apply roughened surface finish according to ACI 318 to precast concrete units that receive concrete topping after installation.

2.15 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to evaluate precast structural concrete fabricator's quality-control and testing methods.
   1. Allow testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.

B. Testing: Test and inspect precast structural concrete according to PCI MNL 116 requirements and ASTM C1610/C1610M, ASTM C1611/C1611M, ASTM C1621/C1621M, and ASTM C1712/C1712M.

C. Strength of precast structural concrete units is considered deficient if units fail to comply with ACI 318 requirements for concrete strength.

D. If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 requirements, employ a qualified testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C42/C42M.
   1. A minimum of three representative cores shall be taken from units of suspect strength, from locations directed by Architect.
   2. Test cores in an air-dry condition or, if units are wet under service conditions, test cores after immersion in water in a wet condition.
   3. Strength of concrete for each series of three cores is considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
   4. Report test results in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports include the following:
      a. Project identification name and number.
      b. Date when tests were performed.
      c. Name of precast concrete fabricator.
      d. Name of concrete testing agency.
      e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.

E. Patching: If core test results are satisfactory and precast structural concrete units comply with requirements, clean and dampen core holes and solidly fill with same precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.

F. Defective Units: Discard and replace precast structural concrete units that do not comply with requirements, including strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Do not install precast concrete units until supporting, cast-in-place concrete has attained minimum allowable design compressive strength and until supporting steel or other structure is structurally ready to receive loads from precast concrete units.

3.2 INSTALLATION

A. Install clips, hangers, bearing pads, and other accessories required for connecting precast structural concrete units to supporting members and backup materials.

B. Erect precast structural concrete level, plumb, and square within specified allowable tolerances. Provide temporary structural framing, shoring, and bracing as required to maintain position, stability, and alignment of units until permanent connections are complete.
   1. Install temporary steel or plastic spacing shims or bearing pads as precast structural concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
   2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
   3. Remove projecting lifting devices and use plastic patch caps or sand-cement grout to fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.

C. Connect precast structural concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
   1. Do not permit connections to disrupt continuity of roof flashing.

D. Field cutting of precast units is not permitted without approval of Architect.

E. Fasteners: Do not use drilled or powder-actuated fasteners for attaching accessory items to precast, prestressed concrete units.

F. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
   1. Protect precast structural concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
   2. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and reprime damaged painted surfaces.
   3. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.

G. Grouting or Dry-Packing Connections and Joints: Grout connections and joints and open spaces at keyways, connections, and joints where required or indicated on Shop Drawings. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled.
   1. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces.

2. Fill joints completely without seepage to other surfaces.
3. Trowel top of grout joints on roofs smooth and uniform. Finish transitions between different surface levels not steeper than 1 to 12.
4. Place grout end cap or dam in voids at ends of hollow-core slabs.
5. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.
6. Keep grouted joints damp for not less than 24 hours after initial set.

3.3 ERECTION TOLERANCES

A. Erect precast structural concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135.

B. Minimize variations between adjacent slab members by jacking, loading, or other method recommended by fabricator and approved by Architect.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Erection of precast structural concrete members.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

C. Visually inspect field welds and test according to ASTM E165 or to ASTM E709 and ASTM E1444. High-strength bolted connections are subject to inspections.

D. Testing agency will report test results promptly and in writing to Contractor and Architect.

E. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.

F. Additional testing and inspecting, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.

G. Prepare test and inspection reports.

3.5 REPAIRS

A. Repair precast structural concrete units if permitted by Architect.
   1. Repairs may be permitted if structural adequacy, serviceability, durability, and appearance of units have not been impaired.

3.6 CLEANING

A. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.

B. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
   1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's written recommendations. Protect other work from staining or damage due to cleaning operations.
   2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 41 00

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SECTION 03 52 16 - LIGHTWEIGHT INSULATING CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cast-in-place cellular foam lightweight insulating concrete.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For lightweight insulating concrete.
   1. Include plans, sections, and details showing roof slopes, thicknesses, and embedded insulation board.
   2. Indicate locations of penetrations, perimeter terminations and curbs, control and expansion joints, and drains.

C. Design Mixtures: For each lightweight insulating concrete mixture.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For the following:
   1. Cementitious materials.
   2. Lightweight aggregates.
   3. Foaming agents.
   4. Admixtures.
   5. Molded-polystyrene insulation board.

C. Evaluation Reports: For lightweight insulating concrete, from ICC-ES.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1.6 FIELD CONDITIONS

A. Do not place lightweight insulating concrete unless ambient temperature is at least 40 deg F and rising.
   1. When air temperature has fallen or is expected to fall below 40 deg F, heat water to a maximum 120 deg F before mixing so lightweight insulating concrete, at point of placement, reaches a temperature of 50 deg F minimum and 80 deg F maximum.

B. Do not place lightweight insulating concrete during rain or snow or on surfaces covered with standing water, snow, or ice.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 CELLULAR LIGHTWEIGHT INSULATING CONCRETE

A. Produce cellular lightweight insulating concrete with the following minimum physical properties using cementitious materials, air-producing liquid-foaming agents complying with ASTM C869/C869M, and the minimum amount of water necessary to produce a workable mix:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
      a. Aerix Industries.
      b. Cellucrete Corp.
      c. Siplast.
   2. Lower-Density Product:
      a. As-Cast Unit Weight: 34 to 42 lb/cu. ft. at point of placement, when tested according to ASTM C138/C138M.
      b. Oven-Dry Unit Weight: 26 to 32 lb/cu. ft., when tested according to ASTM C495.
      c. Compressive Strength: Minimum 190 psi, when tested according to ASTM C495.

2.3 MATERIALS

A. Cementitious Material: Portland cement, ASTM C150/C150M, Type I. Supplement with fly ash, ASTM C618, Class C or F.

B. Water: Clean, potable.

C. Joint Filler: ASTM C612, Class 2, glass-fiber type; compressing to one-half thickness under a load of 25 psi.

D. Molded-Polystyrene Insulation Board: ASTM C578, Type I, 0.90-lb/cu. ft. minimum density.
   1. Provide units with manufacturer's standard keying slots or holes of 3 to 4 percent of board's gross surface area.

2.4 DESIGN MIXTURES

A. Prepare design mixtures for each type and strength of lightweight insulating concrete by laboratory trial batch method or by field-test data method. For trial batch method, use a qualified independent testing agency for preparing and reporting proposed mixture designs.
   1. Limit use of fly ash to not exceed 25 percent of portland cement by weight.

B. Limit water-soluble chloride ions to the maximum percentage by weight of cement or cementitious material permitted by ACI 301.

PART 3 - EXECUTION

3.1 PREPARATION

A. Control Joints: Install control joints at perimeter of roof deck and at junctures with vertical surfaces, including curbs, walls, and vents, for full depth of lightweight insulating concrete. Fill control joints with joint filler.
   1. Provide 1-inch- wide control joints for roof dimensions up to 100 feet in length; 1-1/2-inch- wide control joints for roof dimensions exceeding 100 feet.

3.2 MIXING AND PLACING

A. Mix and place lightweight insulating concrete according to manufacturer's written instructions, using equipment and procedures to avoid segregation of mixture and loss of air content.

B. Install insulation board according to lightweight insulating concrete manufacturer's written instructions. Place insulation board in wet, lightweight insulating concrete slurry poured a minimum of 1/8 inch over the structural substrate. Ensure full contact of insulation board with slurry. Stagger joints and tightly butt insulation boards. Allow slurry coat to set prior to placing remaining thickness of lightweight insulating concrete.
   1. Install insulation board in a stair-step configuration with a maximum step-down of 1 inch.

C. Deposit and screed lightweight insulating concrete in a continuous operation until an entire panel or section of roof area is completed. Do not vibrate or work mix except for screeding or floating. Place to depths and slopes indicated.

D. Finish top surface smooth, free of ridges and depressions, and maintain surface in condition to receive subsequent roofing system.

E. Begin curing operations immediately after placement, and air cure for not less than three days, according to manufacturer's written instructions.

F. If ambient temperature falls below 32 deg F, protect lightweight insulating concrete from freezing and maintain temperature recommended by manufacturer for 72 hours after placement.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to sample materials and perform tests and inspections.

B. Testing of samples of lightweight insulating concrete obtained according to ASTM C172/C172M, except as modified by ASTM C495, to be performed according to the following requirements:
   1. Determine as-cast unit weight during each hour of placement, according to ASTM C138/C138M.
   2. Determine oven-dry unit weight and compressive strength according to ASTM C495. Make a set of at least six molds for each day's placement, but not less than one set of molds for each 5000 sq. ft. of roof area.
   3. Perform additional tests when test results indicate that as-cast unit weight, oven-dry unit weight, compressive strength, or other requirements have not been met.
      a. Retest cast-in-place lightweight insulating concrete for oven-dry unit weight and compressive strength.

C. Prepare test and inspection reports.

END OF SECTION 03 52 16

SECTION 03 54 16 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Hydraulic cement underlayment.
   2. Primer.
   3. Surface sealer.

B. Shop Drawings: Include plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.
   1. Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENTS

A. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. ARDEX Americas; K-15 Self-Leveling Underlayment Concrete.
      b. CMP Specialty Products; Level-1.
      c. Maxxon Corporation; Level-Right.
      d. Schonox AP Rapid; Schonox.
   2. Cement Binder: ASTM C150/C150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
   3. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C109/C109M.

B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.
   1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than 70 deg F.

D. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.
   1. Perform porosity testing to determine appropriate primer.

E. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

2.2 PATCHING MATERIAL

A. Patching Compound and Primer:
   1. Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for conditions affecting performance of the Work.

B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare and clean substrate according to manufacturer's written instructions.
   1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
   2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
   1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 85 percent relative humidity level measurement, or as recommended by hydraulic cement underlayment manufacturer.

C. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.

D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 INSTALLATION

A. Apply primer and install patching compound at removal of walls and where recess require pre-filling.

B. Mix and install underlayment components according to manufacturer's written instructions.
   1. Close areas to traffic during underlayment installation and for time period after installation recommended in writing by manufacturer.
   2. Coordinate installation of components to provide optimum adhesion to substrate and between coats.
   3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

C. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

D. Install underlayment to produce uniform, level surface.
   1. Install a final layer without aggregate to product surface.
   2. Feather edges to match adjacent floor elevations.

E. Cure underlayment according to manufacturer's written instructions. Prevent contamination during installation and curing processes.

F. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

G. Apply surface sealer at rate recommended by manufacturer.

H. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 INSTALLATION TOLERANCES

A. Finish and measure surface, so gap at any point between gypsum cement underlayment surface and an unleveled, freestanding, 10-foot- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch and 1/16 inch in 2 feet.

3.5 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 03 54 16

SECTION 04 01 10 - MASONRY CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cleaning the following:
   1. Unit masonry surfaces.

1.2 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi.

B. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to cleaning masonry including, but not limited to, the following:
      a. Verify masonry-cleaning equipment and facilities needed to make progress and avoid delays.
      b. Materials, material application, and sequencing.
      c. Cleaning program.
      d. Coordination with building occupants.

1.4 SEQUENCING AND SCHEDULING

A. Work Sequence: Perform masonry-cleaning work in the following sequence:
   1. Refer to Section 04 01 20.64 – Brick Masonry Repointing.

B. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units according to masonry repair Sections. Patch holes in mortar joints according to masonry repointing Sections.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include material descriptions and application instructions.
   2. Include test data substantiating that products comply with requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Preconstruction Test Reports: For cleaning materials and methods.

B. Cleaning program.

1.7 QUALITY ASSURANCE

A. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection, preconstruction product testing, and on-site assistance.

B. Brick Cleaning Qualifications: Engage an experienced masonry cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only cleaning new masonry is insufficient experience for masonry cleaning work.
   1. Worker Qualifications: Persons who are experienced and specialize in brick cleaning work of types they will be performing.

C. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used; protection of surrounding materials; and control of runoff during operations. Include provisions for supervising worker performance and preventing damage.
   1. If materials and methods other than those indicated are proposed for any phase of cleaning work, add a written description of such materials and methods, including evidence of successful use on comparable projects and demonstrations to show their effectiveness for this Project.

D. Mockups: Prepare mockups of cleaning on existing surfaces to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Cleaning: Clean an area approximately 25 sq. ft. for each type of masonry and surface condition.
      a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not test cleaners and methods known to have deleterious effect.
      b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage one or more chemical-cleaner manufacturers to perform preconstruction testing on masonry surfaces.
   1. Use test areas as indicated and representative of proposed materials and existing construction.
   2. Propose changes to materials and methods to suit Project.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry-cleaning work to be performed according to product manufacturers' written instructions and specified requirements.

B. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least seven days after completion of cleaning.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Diedrich Technologies.
2. Dumond.
3. PROSOCO.

2.2 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.

D. Mold, Mildew, and Algae Remover, Job Mixed: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.

E. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.
1. Product/Manufacturer: Basis of design.
a. Enviro Klean 2010 All Surface Cleaner; PROSOCO.

2.3 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

2.4 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended in writing by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent paint removers and chemical cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
   1. Cover adjacent surfaces with materials that are proven to resist paint removers and chemical cleaners used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents according to manufacturer's written instructions. Do not apply liquid strippable masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
   2. Do not apply chemical solutions during winds of enough force to spread them to unprotected surfaces.
   3. Neutralize alkaline and acid wastes before disposal.
   4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

3.2 CLEANING MASONRY, GENERAL

A. Cleaning Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 50 feet away by Architect.

B. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water do not wash over dry, cleaned surfaces.

C. Use only those cleaning methods indicated for each masonry material and location.
   1. Brushes: Do not use wire brushes or brushes that are not resistant to chemical cleaner being used.
   2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that cleaning methods do not damage surfaces, including joints.
      a. Equip units with pressure gages.
      b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
      c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.

d. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

D. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces. Keep wall wet below area being cleaned to prevent streaking from runoff.

E. Perform additional general cleaning, paint and stain removal, and spot cleaning of small areas that are noticeably different when viewed according to the "Cleaning Appearance Standard" Paragraph, so that cleaned surfaces blend smoothly into surrounding areas.

F. Water Application Methods:
1. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from masonry surface and apply water in horizontal back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.

G. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces according to chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended in writing by manufacturer.

H. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

I. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.3 CLEANING MASONRY

A. Cold-Water Wash: Use cold water applied by low -pressure spray.

B. Hot-Water Wash: Use hot water applied by low -pressure spray.

C. Detergent Cleaning:
1. Wet surface with cold water applied by low-pressure spray.
2. Scrub surface with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.
3. Rinse with cold water applied by low-pressure spray to remove detergent solution and soil.

4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

D. Mold, Mildew, and Algae Removal:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush or low-pressure spray.
3. Scrub surface with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that surface remains wet.
4. Rinse with cold water applied by low -pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

E. Nonacidic Liquid Chemical Cleaning:
1. Wet surface with cold water applied by low-pressure spray.
2. Apply cleaner to surface by brush or low-pressure spray.
3. Let cleaner remain on surface for period established by mockup.
4. Rinse with cold water applied by low -pressure spray to remove chemicals and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam cleaning.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage chemical-cleaner manufacturer's factory-authorized service representatives for consultation and Project-site inspection, to perform preconstruction product testing, and provide on-site assistance when requested by Architect. Have chemical-cleaner manufacturer's factory-authorized service representatives visit Project site not less than twice to observing progress and quality of the work.

3.5 FINAL CLEANING

A. Clean adjacent nonmasonry surfaces of spillage and debris. Use detergent and soft brushes or cloths.

B. Remove debris from roofs and roof drains. Rinse off roof and flush roof drainage.

C. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 04 01 10

SECTION 04 01 20.63 - BRICK MASONRY REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Repairing brick masonry.

1.2 DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

B. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.

C. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of bricks to freezing and thawing.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to brick masonry repair including, but not limited to, the following:
      a. Verify brick masonry repair specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
      b. Materials, material application, sequencing, tolerances, and required clearances.
      c. Quality-control program.
      d. Coordination with building occupants.

1.4 SEQUENCING AND SCHEDULING

A. Order sand and gray portland cement for colored mortar immediately after approval of Samples. Take delivery of and store at Project site enough quantity to complete Project.

B. Work Sequence: Perform brick masonry repair work in the following sequence, which includes work specified in this and other Sections:
   1. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
   2. Repair masonry, including replacing existing masonry with new masonry materials.
   3. Rake out mortar from joints to be repointed.
   4. Point mortar and sealant joints.
   5. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in bricks according to "Brick Masonry Patching" Article. Patch holes in mortar joints according to Section 04 01 20.64 "Brick Masonry Repointing."

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Include recommendations for product application and use.
   3. Include test data substantiating that products comply with requirements.

B. Samples for Verification: For the following:
   1. Each type of brick unit to be used for replacing existing units. Include sets of Samples to show the full range of shape, color, and texture to be expected. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.
   2. Each type of patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For brick masonry repair specialist including field supervisors and workers and testing service.

B. Preconstruction Test Reports: For existing bricks and mortar and replacement bricks.

1.7 QUALITY ASSURANCE

A. Brick Masonry Repair Specialist Qualifications: Engage an experienced brick masonry repair firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repair work.
   1. Work must be performed by a firm having not less than 5 years successful experience in comparable masonry restoration projects and employing personnel skilled in the restoration processes and operations indicated.
   2. Field Supervision: Brick masonry repair specialist firm shall maintain experienced full-time supervisors on Project site during times that brick masonry repair work is in progress.
   3. Brick Masonry Repair Worker Qualifications: When bricks are being patched, assign at least one worker per crew who is trained and certified by manufacturer of patching compound to apply its products.

B. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
   1. Masonry Repair: Prepare sample areas for each type of masonry repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 48 inches in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
      a. Replacement: Four brick units replaced.
      b. Patching: Three small holes at least 1 inch in diameter for each type of brick indicated to be patched.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on brick masonry as follows:
   1. Existing Brick: Test each type of existing brick indicated for replacement according to testing methods in ASTM C67 for compressive strength, 24-hour cold-water absorption, five-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove five existing units from locations designated by Architect. Take testing samples from these units.
   2. Existing Mortar: Test according to ASTM C1324, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver bricks to Project site strapped together in suitable packs or pallets or in heavy-duty cartons and protected against impact and chipping.

B. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store sand where grading and other required characteristics can be maintained and contamination avoided.

F. Handle bricks to prevent overstressing, chipping, defacement, and other damage.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

B. Temperature Limits: Repair brick masonry only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:
   1. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
   2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for seven days after repair.

D. Hot-Weather Requirements: Protect masonry repairs when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Source Limitations: Obtain each type of material for repairing brick masonry (brick, cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MASONRY MATERIALS

A. Face Brick: As required to complete brick masonry repair work.
   1. Brick Matching Existing: Units with colors, color variation within units, surface texture, size, and shape that match existing brickwork and with physical properties within 10 percent of those determined from preconstruction testing of selected existing units.
      a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and

variation rather than brick that matches an individual color within that range.

2. Special Shapes:
   a. Provide molded, 100 percent solid shapes for applications where core holes or "frogs" could be exposed to view or weather when in final position and where shapes produced by sawing would result in sawed surfaces being exposed to view.
   b. Provide specially ground units, shaped to match patterns, for arches and where indicated.
   c. Mechanical chopping or breaking brick, or bonding pieces of brick together by adhesive, are unacceptable procedures for fabricating special shapes.
3. Tolerances as Fabricated: According to tolerance requirements in ASTM C216, Type FBS.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white or gray, or both where required for color matching of mortar.
   1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Sand: ASTM C144.
   1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
   2. Colored Mortar: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.

D. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars.

E. Water: Potable.

2.4 MANUFACTURED REPAIR MATERIALS

A. Brick Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching brick masonry.
   1. Products: Subject to compliance with requirements, provide the following:
      a. Conproco Corporation; Matrix (Mimic).
   2. Use formulation that is vapor and water permeable (equal to or more than the brick), exhibits low shrinkage, has lower modulus of elasticity than bricks being repaired, and develops high bond strength to all types of masonry.
   3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.

4. Formulate patching compound in colors and textures to match each brick being patched. Provide sufficient number of colors to enable matching of the color, texture, and variation of each unit.

2.5 ACCESSORY MATERIALS

A. Setting Buttons and Shims: Resilient plastic, nonstaining to masonry, sized to suit joint thicknesses and bed depths of bricks, less the required depth of pointing materials unless removed before pointing.

B. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.

C. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer according to MPI #23 (surface-tolerant, anticorrosive metal primer) or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.
   1. Surface Preparation: Use coating requiring no better than SSPC-SP 3, "Power Tool Cleaning" or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" surface preparation according to manufacturer's literature or certified statement.

D. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
   1. Previous effectiveness in performing the work involved.
   2. Minimal possibility of damaging exposed surfaces.
   3. Consistency of each application.
   4. Uniformity of the resulting overall appearance.
   5. Do not use products or tools that could leave residue on surfaces.

2.6 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
   1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent, unless otherwise demonstrated by a satisfactory history of performance.

C. Do not use admixtures in mortar unless otherwise indicated.

D. Mixes: Mix mortar materials in the following proportions:
   1. Rebuilding (Setting) Mortar by Volume: ASTM C270, Proportion Specification, 1 part portland cement, 1 part lime, and 6 parts sand.

2. Pigmented, Colored Mortar: Add mortar pigments to produce exposed, setting (rebuilding) mortar of colors required.

PART 3 - EXECUTION

3.1 PROTECTION

A. Prevent mortar from staining face of surrounding masonry and other surfaces.
   1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
   2. Keep wall area wet below rebuilding and repair work to discourage mortar from adhering.
   3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

B. Remove gutters and downspouts and associated hardware adjacent to masonry and store during masonry repair. Reinstall when repairs are complete.
   1. Provide temporary rain drainage during work to direct water away from building.

3.2 MASONRY REPAIR, GENERAL

A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

3.3 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated or are to be reused. Carefully remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
   1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area.

C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition. Coordinate with new flashing, reinforcement, and lintels, which are specified in other Sections.

D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

E. Remove in an undamaged condition as many whole bricks as possible.
   1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
   2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
   3. Store brick for reuse. Store off ground, on skids, and protected from weather.

4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

F. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for brick replacement.

G. Replace removed damaged brick with other removed brick in good condition, where possible, or with new brick matching existing brick. Do not use broken units unless they can be cut to usable size.

H. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

I. Lay replacement brick with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. Rake out mortar used for laying brick before mortar sets according to Section 04 01 20.64 "Brick Masonry Repointing." Point at same time as repointing of surrounding area.
3. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.

J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.4 PAINTING STEEL UNCOVERED DURING THE WORK

A. Notify Architect if steel is exposed during masonry removal. Where Architect determines that steel is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
1. Surface Preparation: Remove paint, rust, and other contaminants according to SSPC-SP 3, "Power Tool Cleaning" or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning", as applicable to comply with paint manufacturer's recommended preparation.
2. Antirust Coating: Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).

B. If on inspection and rust removal, the thickness of a steel member is found to be reduced from rust by more than 1/16 inch, notify Architect before proceeding.

3.5 BRICK MASONRY PATCHING

A. Patch the following bricks unless another type of repair or replacement is indicated:
   1. Bricks indicated to be patched.

B. Patching Bricks:
   1. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 inch thick, but not less than recommended in writing by patching compound manufacturer.
   2. Mask adjacent mortar joint or rake out for repointing if patch extends to edge of brick.
   3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
   4. Rinse surface to be patched and leave damp, but without standing water.
   5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
   6. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
   7. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of brick. Shape and finish surface before or after curing, as determined by testing, to best match existing brick.
   8. Keep each layer damp for 72 hours or until patching compound has set.
   9. Remove and replace patches with hairline cracks or that show separation from brick at edges, and those that do not match adjoining brick in color or texture.

3.6 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.
   1. Do not use metal scrapers or brushes.
   2. Do not use acidic or alkaline cleaners.

B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Remove masking materials, leaving no residues that could trap dirt.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

C. Notify inspectors and Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors and Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

3.8 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property.

B. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

END OF SECTION 04 01 20.63

SECTION 04 01 20.64 - BRICK MASONRY REPOINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Repointing joints with mortar.

1.2 DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to repointing masonry including, but not limited to, the following:
      a. Verify brick masonry repointing specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
      b. Materials, material application, sequencing, tolerances, and required clearances.
      c. Quality-control program.
      d. Coordination with building occupants.

1.4 SEQUENCING AND SCHEDULING

A. Order sand and gray portland cement for pointing mortar immediately after approval of Samples. Take delivery of and store at Project site enough quantity to complete Project.

B. Work Sequence: Perform brick masonry repointing work in the following sequence, which includes work specified in this and other Sections:
   1. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
   2. Repair masonry, including replacing existing masonry with new masonry materials.
   3. Rake out mortar from joints to be repointed.
   4. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
   5. Clean masonry.
   6. Where water repellents are to be used on or near masonry work, delay application of these chemicals until after pointing and cleaning.

C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry. Patch holes in mortar joints according to "Repointing" Article.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Include recommendations for product application and use.
   3. Include test data substantiating that products comply with requirements.

B. Samples for Verification: For the following:
   1. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.
      a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.
   2. Accessories: Each type of accessory and miscellaneous support.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For brick masonry repointing specialist including field supervisors and workers and testing service.

B. Preconstruction Test Reports: For existing bricks and mortar.

1.7 QUALITY ASSURANCE

A. Brick Masonry Repointing Specialist Qualifications: Engage an experienced brick masonry repointing firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing masonry is insufficient experience for masonry repointing work.
   1. Field Supervision: Brick masonry repointing specialist firms shall maintain experienced full-time supervisors on Project site during times that brick masonry repointing work is in progress.

B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage.

C. Mockups: Prepare mockups of brick masonry repointing to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Repointing: Rake out joints in two separate areas, each approximately 36 inches high by 48 inches wide for each type of repointing required, and repoint one of the areas.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on masonry units as follows:
   1. Existing Mortar: Test according to ASTM C1324, modified as agreed by testing service and Architect for Project requirements, to determine proportional composition of original ingredients, sizes and colors of aggregates, and approximate strength.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

D. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit repointing work to be performed according to product manufacturers' written instructions and specified requirements.

B. Temperature Limits: Repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least seven days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for mortar-joint pointing unless otherwise indicated:
   1. When air temperature is below 40 deg F, heat mortar ingredients and existing masonry walls to produce temperatures between 40 and 120 deg F.
   2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for seven days after pointing.

D. Hot-Weather Requirements: Protect mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar materials. Provide artificial shade and wind breaks, and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Source Limitations: Obtain each type of material for repointing brick masonry (cement, sand, etc.) from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; white or gray, or both where required for color matching of mortar.
   1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Sand: ASTM C144.
   1. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
   2. Color: Natural sand or ground marble, granite, or other sound stone of color necessary to produce required mortar color.

D. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in masonry mortars.

E. Water: Potable.

2.3 ACCESSORY MATERIALS

A. Masking Tape: Nonstaining, nonabsorbent material; compatible with mortar, joint primers, sealants, and surfaces adjacent to joints; and that easily comes off entirely, including adhesive.

B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
   1. Previous effectiveness in performing the work involved.
   2. Minimal possibility of damaging exposed surfaces.
   3. Consistency of each application.
   4. Uniformity of the resulting overall appearance.
   5. Do not use products or tools that could leave residue on surfaces.

2.4 MORTAR MIXES

A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
   1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again, adding only enough water to produce a damp, unworkable mix that retains its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
   1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent, unless otherwise demonstrated by a satisfactory history of performance.

C. Do not use admixtures in mortar unless otherwise indicated.

D. Mixes: Mix mortar materials in the following proportions:
   1. Pointing Mortar by Volume: ASTM C270, Proportion Specification, 1 part portland cement, 1 part lime, and 6 parts sand. Add mortar pigments to produce mortar colors required.

PART 3 - EXECUTION

3.1 PROTECTION

A. Prevent mortar from staining face of surrounding masonry and other surfaces.
   1. Cover sills, ledges, and other projecting items to protect them from mortar droppings.
   2. Keep wall area wet below pointing work to discourage mortar from adhering.
   3. Immediately remove mortar splatters in contact with exposed masonry and other surfaces.

B. Remove gutters and downspouts and associated hardware adjacent to masonry and store during masonry repointing. Reinstall when repointing is complete.
   1. Provide temporary rain drainage during work to direct water away from building.

3.2 MASONRY REPOINTING, GENERAL

A. Appearance Standard: Repointed surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

3.3 REPOINTING

A. Rake out and repoint joints to the following extent:
   1. All joints in areas indicated.
   2. Joints indicated as sealant-filled joints.
   3. Joints at locations of the following defects:
      a. Holes and missing mortar.
      b. Cracks that can be penetrated 1/4 inch or more by a knife blade 0.027 inch thick.
      c. Cracks 1/8 inch or more in width and of any depth.
      d. Hollow-sounding joints when tapped by metal object.
      e. Eroded surfaces 1/4 inch or more deep.
      f. Deterioration to point that mortar can be easily removed by hand, without tools.
      g. Joints filled with substances other than mortar.

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows, according to procedures demonstrated in approved mockup:
   1. Remove mortar from joints to depth of 2-1/2 times joint width and not less than that required to expose sound, unweathered mortar. Do not remove unsound mortar more than 2 inches deep; consult Architect for direction.
   2. Remove mortar from brick and other masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
   3. Do not spall edges of brick or other masonry units or widen joints. Replace or patch damaged or other masonry units as directed by Architect.

D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Pointing with Mortar:
   1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
   2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer, and allow it to become thumbprint hard before applying next layer.
   3. After deep areas have been filled to same depth as remaining joints, point joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.

4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
6. Hairline cracking within mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

F. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.4 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.
1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

B. Clean adjacent nonmasonry surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Remove masking materials, leaving no residues that could trap dirt.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage qualified testing agency to perform tests and inspections. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

C. Notify inspectors and Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until inspectors and Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION 04 01 20.64

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SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete masonry units.
2. Brick.
3. Mortar and grout materials.
4. Reinforcement.
5. Ties and anchors.
6. Embedded flashing.
7. Accessories.
8. Mortar and grout mixes.

B. Products Installed but not Furnished under This Section:
1. Cast-stone trim in unit masonry.
2. Stone trim units in unit masonry.
3. Steel lintels in unit masonry.
4. Steel shelf angles for supporting unit masonry.
5. Cavity wall insulation adhered to masonry backup.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:
1. Masonry Units: Indicate sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Indicate bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315R. Indicate elevations of reinforced walls.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:
1. Decorative CMUs, in the form of small-scale units.
2. Clay face brick, in the form of straps of five or more bricks.
3. Colored mortar.
4. Weep/cavity vents.

D. Samples for Verification: For each type and color of the following:
1. Decorative CMUs.

2. Clay face brick, in the form of straps of five or more bricks.
3. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
4. Weep/cavity vents.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type of the following:
   1. Masonry units.
      a. Include material test reports substantiating compliance with requirements.
      b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
      c. For exposed brick, include test report for efflorescence in accordance with ASTM C67/C67M.
      d. For masonry units, include data and calculations establishing average net-area compressive strength of units.
   2. Cementitious materials. Include name of manufacturer, brand name, and type.
   3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
   4. Grout mixes. Include description of type and proportions of ingredients.
   5. Reinforcing bars.
   6. Joint reinforcement.
   7. Anchors, ties, and metal accessories.

B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
   2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.

C. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602.

D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Installers: All masonry flashing installers must complete the International Masonry Institute Flashing Upgrade training course.
   2. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

1.6 MOCKUPS

A. Wall Mockups: Build mockups to set quality standards for materials and execution and to set quality standards for installation.
   1. Build mockups for typical exterior wall in sizes approximately 72 inches long by 72 inches high by full thickness, including face and backup wythes and accessories.
      a. Include a sealant-filled joint at least 16 inches long in exterior wall mockup.
      b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
      c. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
      d. Include metal studs, sheathing, air barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
   2. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
   3. Clean exposed faces of mockups with masonry cleaner as indicated.
   4. Protect accepted mockups from the elements with weather-resistant membrane.
   5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
   2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain exposed masonry units from single manufacturer.

B. For cementitious mortar components, obtain each color and grade from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
   1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with TMS 602.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 ft. vertically and horizontally of a walking surface.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
   1. Where fire-resistance-rated construction is indicated, use the equivalent thickness method for masonry units in accordance with ACI 216.1.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   2. Provide bullnose units for outside corners unless otherwise indicated.

B. CMUs: ASTM C90, normal weight.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi.
   2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

C. Decorative CMUs: ASTM C90, normal weight.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2000 psi.
   2. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph above.
   3. Pattern and Texture: Ground-face finish, match adjacent existing ground-face masonry units.

2.5 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
   1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
   2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

B. Clay Face Brick: Facing brick complying with ASTM C216, Grade SW, Type FBS.
   1. Product/Manufacturer: Basis of design.
      a. Modular English Clinker; Ragland Clay Products.
   2. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested in accordance with ASTM C67/C67M.
   3. Efflorescence: Provide brick that has been tested in accordance with ASTM C67/C67M and is rated "not effloresced."
   4. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
   5. Application: Use where brick is exposed unless otherwise indicated.

2.6 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
   1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

E. Preblended Dry Mortar Mix: Packaged blend made from portland cement and hydrated lime, sand, and mortar pigments, complying with ASTM C1714/C1714M.

F. Aggregate for Mortar: ASTM C144.
   1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
   2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
   3. White-Mortar Aggregates: Natural white sand or crushed white stone.

4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Aggregate for Grout: ASTM C404.

H. Water: Potable.

2.7 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.

B. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
1. Interior Walls: Hot-dip galvanized carbon steel.
2. Exterior Walls: Stainless steel.
3. Wire Size for Side Rods: 0.148-inch diameter.
4. Wire Size for Cross Rods: 0.148-inch diameter.
5. Wire Size for Veneer Ties: 0.148-inch diameter.
6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
7. Provide in lengths of not less than 10 ft., with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

D. Masonry-Joint Reinforcement for Multiwythe Masonry:
1. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.

2.8 TIES AND ANCHORS

A. General: Ties and anchors extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A153/A153M, Class B-2 coating.
2. Stainless Steel Wire: ASTM A580/A580M, Type 316.
3. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
4. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 316.
5. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
6. Stainless Steel Bars: ASTM A276 or ASTM A666, Type 304.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.
   2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel wire.

D. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.060-inch- thick steel sheet, galvanized after fabrication.
   2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel wire.

E. Adjustable Masonry-Veneer Anchors:
   1. General: Provide anchors that allow vertical adjustment but resist a 100 lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
   2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0781-inch- thick, stainless steel sheet.
   3. Fabricate wire ties from 0.187-inch- diameter, stainless steel wire unless otherwise indicated.
   4. Masonry-Veneer Anchors; Single-Barrel Screw with Double-Pintle Wingnut: Self-drilling, single-barrel screw with thermally resistant wingnut head designed to receive double-pintle wire tie. Screw has a smooth barrel the same thickness as insulation with factory-installed gasketed washer to seal at face of insulation and sheathing.
      a. Products: Subject to compliance with requirements, provide the following:
         1) Veneer Anchor: Hohmann & Barnard, Inc; Thermal Concrete 2-Seal Wing Nut Anchor.
         2) Veneer Anchor: Hohmann & Barnard, Inc; Thermal 2-Seal Wing Nut Anchor.
   5. Stainless Steel Drill Screws for Steel Studs: ASTM C954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 diameter by length required to penetrate steel stud flange with not less than three exposed threads; either made from Type 410 stainless steel or made with a carbon-steel drill point and 300 Series stainless steel shank.

2.9 EMBEDDED FLASHING

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
   1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch thick.
   2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 ft.. Provide splice plates at joints of formed, smooth metal flashing.

3. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
4. Solder metal items at corners.

B. Flexible Flashing: Use the following unless otherwise indicated:
1. Copper-Fabric Flashing: 7 oz./sq. ft. copper sheet bonded between two layers of glass-fiber cloth.

C. Solder and Sealants for Sheet Metal Flashings:
1. Solder for Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
2. Elastomeric Sealant: ASTM C920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

E. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch.

2.10 ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

B. Preformed Control-Joint Gaskets: Made from and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

D. Weep/Cavity Vents: Use the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Mortar Deflector: Strips, 2 inches and 10 inches high, with dovetail-shaped notches that prevent clogging with mortar droppings.

F. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.11 MORTAR AND GROUT MIXES

A. Masonry cements, and mortar cements shall not be acceptable.

B. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.
   2. Use portland cement-lime mortar unless otherwise indicated.

C. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

D. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
   1. For masonry below grade or in contact with earth, use Type M.
   2. For reinforced masonry, use Type S.
   3. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type S.

E. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
   1. Pigments do not exceed 10 percent of portland cement by weight.
   2. Mix to match existing mortar color.

F. Grout for Unit Masonry: Comply with ASTM C476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
   2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.1.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
   3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
   2. Verify that foundations are within tolerances specified.
   3. Verify that reinforcing dowels are properly placed.
   4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested in accordance with ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:
   1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
   2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
   3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:
   1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 ft., or 1/2-inch maximum.

2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 ft., or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated on Drawings, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
   1. Install compressible filler in joint between top of partition and underside of structure above.
   2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 43 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:
   1. Bed face shells in mortar and make head joints of depth equal to bed joints.
   2. Bed webs in mortar in all courses of piers, columns, and pilasters.
   3. Bed webs in mortar in grouted masonry, including starting course on footings.
   4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
   5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set stone and cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
   1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
   2. Allow cleaned surfaces to dry before setting.
   3. Wet joint surfaces thoroughly before applying mortar.
   4. Rake out mortar joints for pointing with sealant.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush where indicated to receive cavity wall insulation unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together:
   1. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
      a. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.
   2. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as indicated.
   1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
   1. Fasten anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
   2. Embed tie sections in masonry joints.
   3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
   4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.

B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.
   1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.8 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
   3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

3.9 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
   1. Provide an open space not less than 1 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
   2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
   3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally.

3.10 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:
   1. Install preformed control-joint gaskets designed to fit standard sash block.

C. Form expansion joints in brick as follows:
   1. Build flanges of factory-fabricated, expansion-joint units into masonry.
   2. Build in compressible joint fillers where indicated.
   3. Form open joint full depth of brick wythe and of width indicated, but not less than 1/2 inch for installation of sealant and backer rod specified in Section 07 92 00 "Joint Sealants."

D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 07 92 00 "Joint Sealants," but not less than 3/8 inch.
   1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.11 LINTELS

A. Install steel lintels where indicated.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.12 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
   2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under air barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.
   3. At lintels and shelf angles, extend flashing 6 inches minimum, to edge of next full unit at each end. At heads and sills, extend flashing 6 inches minimum, to edge of next full unit and turn ends up not less than 2 inches to form end dams.
   4. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.

C. Install reglets and nailers for flashing and other related construction where they are indicated to be built into masonry.

D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
   1. Use specified weep/cavity vent products to form weep holes.
   2. Space weep holes 24 inches o.c. unless otherwise indicated.

E. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Accessories" Article.

F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

3.13 REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements will be at Contractor's expense.

B. Inspections: Special inspections in accordance with Level 2 in TMS 402.
   1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
   2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
   3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Clay Masonry Unit Test: For each type of unit provided, in accordance with ASTM C67/C67M for compressive strength.

F. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140/C140M for compressive strength.

G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.

H. Mortar Test (Property Specification): For each mix provided, in accordance with ASTM C780. Test mortar for mortar air content and compressive strength.

I. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.

3.15 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
   4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
   6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
   7. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.16 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

C. Masonry Waste: Remove masonry waste and legally dispose of off Owner's property.

END OF SECTION 04 20 00

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SECTION 04 43 13.13 - ANCHORED STONE MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Stone masonry anchored to concrete backup.
   2. Stone masonry anchored to unit masonry backup.

1.2 ACTION SUBMITTALS

A. Product Data: For each variety of stone, stone accessory, and manufactured product.

B. Samples for Verification:
   1. For each stone type indicated. Include at least three Samples in each set and show the full range of color and other visual characteristics in completed Work.
   2. For each color of mortar required. Label Samples to indicate types and amounts of pigments used.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs experienced stonemasons and stone fitters.

B. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Build mockups for each type of stone masonry in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.
      a. Include through-wall flashing installed for a 24-inch length in corner of mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit stone masonry above half of flashing).
   2. Protect accepted mockups from the elements with weather-resistant membrane.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

C. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, in a dry location, or in covered weatherproof dispensing silos.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 FIELD CONDITIONS

A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining stone masonry face.
   1. Protect base of walls from rain-splashed mud and mortar splatter using coverings spread on the ground and over the wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than seven days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1.7 COORDINATION

A. Advise installers of adjacent Work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone masonry.

B. Coordinate locations of dovetail slots installed in concrete that are to receive stone anchors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from single quarry with resources to provide materials of consistent quality in appearance and physical properties.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from single manufacturer and each aggregate from single source or producer.

2.2 GRANITE

A. Material Standard: Comply with ASTM C615/C615M.

B. Stone Veneer:
1. Corinthian Granite, Roughly Squared / Rectangular; Champlain Stone LTD.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type II, except Type III may be used for cold-weather construction; natural color or white cement may be used as required to produce mortar color indicated.
1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in stone masonry mortar.

E. Aggregate: ASTM C144 and as follows:
1. For pointing mortar, use aggregate graded with 100 percent passing No. 16 sieve.

2. White Aggregates: Natural white sand or ground white stone.
3. Colored Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.

F. Water: Potable.

2.4 VENEER ANCHORS

A. Materials:
1. Stainless Steel Wire: ASTM A580/A580M, Type 316.
2. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 316.

B. Size: Sufficient to extend at least halfway, but not less than 1-1/2 inches, through stone masonry and with at least a 5/8-inch cover on exterior face.

C. Corrugated-Metal Veneer Anchors: Not less than 0.060-inch- thick by 7/8-inch- wide stainless steel sheet with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch.

D. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.078-inch- thick, stainless steel sheet.
3. Fabricate wire ties from 0.187-inch- diameter, stainless steel wire unless otherwise indicated.
4. Masonry-Veneer Anchors; Single-Barrel Screw with Double-Pintle Wingnut: Self-drilling, single-barrel screw with thermally resistant wingnut head designed to receive double-pintle wire tie. Screw has a smooth barrel the same thickness as insulation.
a. Products: Subject to compliance with requirements, provide the following:
1) Veneer Anchor: Hohmann & Barnard, Inc; Thermal Concrete 2-Seal Wing Nut Anchor.

2.5 STONE TRIM ANCHORS

A. Stone Trim Anchors: Units fabricated with tabs or dowels designed to engage kerfs or holes in stone trim units and holes for fasteners or postinstalled anchor bolts for fastening to substrates or framing as indicated.

B. Materials: Fabricate anchors from stainless steel, ASTM A240/A240M or ASTM A666, Type 316. Fabricate dowels from stainless steel, ASTM A276, Type 316.

C. Fasteners for Stone Trim Anchors: Annealed stainless steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.

D. Postinstalled Anchor Bolts for Fastening Stone Trim Anchors: Chemical anchors or torque-controlled expansion anchors made from stainless steel components complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2 for bolts and nuts; ASTM A666 or ASTM A276, Type 316, for anchors.

2.6 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
   1. Stainless Steel: ASTM A240/A240M, Type 304, 0.016 inch thick.
   2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
   3. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

B. Flexible Flashing: For flashing unexposed to the exterior, use the following unless otherwise indicated:
   1. Copper-Laminated Flashing: 7-oz./sq. ft. copper sheet bonded with asphalt between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.

C. Solder and Sealants for Sheet Metal Flashings:
   1. Solder for Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
   2. Elastomeric Sealant: ASTM C920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

D. Adhesives, Primers, and Seam Tapes for Flexible Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

E. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

B. Weep/Vent Products: Use the following unless otherwise indicated:
   1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

2.8 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

2.9 FABRICATION

A. General: Fabricate stone units in sizes and shapes required to comply with requirements indicated.
   1. For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite."

B. Select stone to produce pieces of thickness, size, and shape indicated, including details on Drawings and pattern specified in "Setting Stone Masonry" Article.

C. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated. Shape beds to fit supports.

D. Cut and drill sinkages and holes in stone for anchors and supports.

E. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units before shipment.
   1. Clean sawed backs of stone to remove rust stains and iron particles.

F. Thickness of Stone: Provide thickness indicated on Drawings.

G. Finish exposed stone faces and edges to comply with requirements indicated for finish and to match approved samples and mockups.

2.10 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride.
   2. Use portland cement-lime mortar unless otherwise indicated.
   3. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for one to two hours. Add remaining water in small portions until mortar reaches required consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Stone Masonry: Comply with ASTM C270, Proportion Specification.
   1. Mortar for Setting Stone: Type S.
   2. Mortar for Pointing Stone: Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
   1. Pigments do not exceed 10 percent of portland cement by weight.
   2. Mix to match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone masonry.

B. Examine substrate to verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in substrates and required for or extending into stone masonry are correctly installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coat concrete and unit masonry backup with asphalt dampproofing.

B. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 INSTALLATION OF STONE MASONRY

A. Perform necessary field cutting and trimming as stone is set.
   1. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.
   2. Use hammer and chisel to split stone that is fabricated with split surfaces. Make edges straight and true, matching similar surfaces that were shop or quarry fabricated.

B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

C. Arrange stones in range ashlar pattern with course heights as indicated, uniform lengths, and uniform joint widths, with offset between vertical joints as indicated.

D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.

E. Install supports, fasteners, and other attachments indicated or necessary to secure stone masonry in place.

F. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

G. Install steel lintels where indicated. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

H. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment if any. Lay walls with joints not less than 1/4 inch at narrowest points or more than 3/8 inch at widest points.

I. Provide sealant joints of widths and at locations indicated.
   1. Keep sealant joints free of mortar and other rigid materials.
   2. Sealant joints are specified in Section 07 92 00 "Joint Sealants."

J. Install embedded flashing and weep holes at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
   1. At multiwythe masonry walls, including cavity walls, extend flashing through stone masonry, turned up a minimum of 8 inches, and extend into or through inner wythe to comply with requirements in Section 04 20 00 "Unit Masonry."
   2. At lintels and shelf angles, extend flashing full length of angles but not less than 6 inches into masonry at each end.
   3. At sills, extend flashing not less than 4 inches at ends.
   4. At ends of head and sill flashing, turn up not less than 2 inches to form end dams.
   5. Install metal drip edges with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 07 92 00 "Joint Sealants" for application indicated.
   6. Install metal drip edges beneath flexible flashing at exterior wall face. Stop flexible flashing 1/2 inch back from exterior wall face and adhere flexible flashing to top of metal drip edge.

K. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
   1. Use vinyl weep holes/vents to form weep holes.
   2. Space weep holes 24 inches o.c.

3. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

3.4 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.

C. Variation of Linear Building Line: For position shown in plan, do not exceed 1/2 inch in 20 feet or 3/4 inch in 40 feet or more.

D. Measure variation from level, plumb, and position shown in plan as a variation of the average plane of each stone face from level, plumb, or dimensioned plane.

E. Variation in Mortar-Joint Thickness: Do not vary from joint size range indicated.

F. Variation in Plane between Adjacent Stones: Do not exceed one-half of tolerance specified for thickness of stone.

3.5 INSTALLATION OF ANCHORED STONE MASONRY

A. Anchor stone masonry to concrete with corrugated-metal veneer anchors unless otherwise indicated. Secure anchors by inserting dovetailed ends into dovetail slots in concrete.

B. Anchor stone masonry to unit masonry with wire anchors unless otherwise indicated. Connect anchors to masonry joint reinforcement by inserting pintles into eyes of masonry joint reinforcement projecting from unit masonry.

C. Anchor stone masonry to unit masonry with adjustable, screw-attached veneer anchors unless otherwise indicated. Fasten anchors to unit masonry with two screws.

D. Embed veneer anchors in mortar joints of stone masonry at least halfway, but not less than 1-1/2 inches, through stone masonry and with at least a 5/8-inch cover on exterior face.

E. Space anchors to provide not less than one anchor per 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings, sealant joints, and perimeter at intervals not exceeding 12 inches.

F. Anchor stone trim with stone trim anchors where indicated. Install anchors by fastening to substrate and inserting tabs and dowels into kerfs and holes in stone units. Provide compressible filler in ends of dowel holes and bottoms of kerfs to prevent end bearing of dowels and anchor tabs on stone. Fill remainder of anchor holes and kerfs with mortar.

G. Set stone in full bed of mortar with full head joints unless otherwise indicated. Build anchors into mortar joints as stone is set.

H. Fill collar joint with mortar as stone is set.

I. Provide 2-inch cavity between stone masonry and backup construction unless otherwise indicated. Keep cavity free of mortar droppings and debris.
   1. Slope beds toward cavity to minimize mortar protrusions into cavity.

J. Rake out joints for pointing with mortar to depth of not less than 1/2 inch before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

3.6 POINTING

A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.

B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.

C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
   1. Joint Profile: Concave.

3.7 ADJUSTING AND CLEANING

A. Remove and replace stone masonry of the following description:
   1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
   2. Defective joints.
   3. Stone masonry not matching approved samples and mockups.
   4. Stone masonry not complying with other requirements indicated.

B. Replace in a manner that results in stone masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone masonry.
   3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
   4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
   5. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20, Revised II, using job-mixed detergent solution.
   6. Clean stone masonry with proprietary acidic cleaner applied according to manufacturer's written instructions.
   7. Clean limestone masonry to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.8 EXCESS MATERIALS AND WASTE

A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.

B. Disposal as Fill Material: Dispose of clean masonry waste, including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
   1. Crush masonry waste to less than 4 inches in greatest dimension.
   2. Mix masonry waste with at least 2 parts of specified fill material for each part of masonry waste. Fill material is specified in Section 31 20 00 "Earth Moving."
   3. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other waste, and legally dispose of off Owner's property.

END OF SECTION 04 43 13.13

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SECTION 04 72 00 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Trim units.
2. Mortar materials.
3. Accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. For cast stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
1. Include building elevations showing layout of units and locations of joints and anchors.

C. Samples for Initial Selection: For colored mortar.

D. Samples for Verification:
1. For each color and texture of cast stone required, 4 inches square in size.
2. For each trim shape required, 4 inches in length.
3. For colored mortar, make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.

E. Full-Size Samples: For each color, texture, and shape of cast stone unit required.
1. Make available for Architect's review at Project site.
2. Make Samples from materials to be used for units used on Project.
3. Approved Samples may be installed in the Work.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.
1. Include copies of material test reports, indicating compliance of cast stone with ASTM C1364.

B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C1364.
1. Provide test reports based on testing within previous six months.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by CSI or APA.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work and to minimize the need for on-site storage.

B. Pack, handle, and ship cast stone units in suitable packs or pallets.
   1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast stone units if required, using dollies with wood supports.
   2. Store cast stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

1.6 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Cast Stone: Obtain cast stone units from single source from single manufacturer.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

2.2 CAST STONE MATERIALS

A. General: Comply with ASTM C1364 and the following:
   1. Compressive Strength - ASTM C 1194: 6,500 psi for products at 28 days or, ASTM C 39: 5000 psi for products at 28 days.
   2. Absorption - ASTM C 1195: 6 percent maximum by weight cold water method, 10 percent maximum by weight boiling method or, ASTM C 642 6 percent maximum by weight.
   3. Air Content – ASTM C173 or C 231 shall be 4 to 8 percent.

B. Portland Cement: ASTM C150/C150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C114. Provide natural color or white cement as required to produce cast stone color indicated.

C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C33/C33M; gradation and colors as needed to produce required cast stone textures and colors.

D. Fine Aggregates: Natural sand or crushed stone complying with ASTM C33/C33M, gradation and colors as needed to produce required cast stone textures and colors.

E. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

F. Admixtures: Use only admixtures specified or approved in writing by Architect.
   1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
   2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
   3. Air-Entraining Admixture: ASTM C260/C260M. Add to mixes for units exposed to the exterior at manufacturer's prescribed rate to result in an air content of 4 to 6 percent, except do not add to zero-slump concrete mixes.
   4. Water-Reducing Admixture: ASTM C494/C494M, Type A.
   5. Water-Reducing, Retarding Admixture: ASTM C494/C494M, Type D.
   6. Water-Reducing, Accelerating Admixture: ASTM C494/C494M, Type E.

G. Reinforcement:
   1. Deformed steel bars complying with ASTM A615/A615M, Grade 60. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches of cast stone material.
      a. Epoxy Coating: ASTM A775/A775M.
      b. Galvanized Coating: ASTM A767/A767M.
   2. Plain-Steel, Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
   3. Galvanized-Steel, Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.

H. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666, Type 316.

2.3 CAST STONE UNITS

A. Cast Stone Units: Comply with ASTM C1364.
   1. Units shall be manufactured using the wet-cast method.
   2. Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.

B. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
   1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
   2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
   3. Provide drips on projecting elements unless otherwise indicated.

C. Fabrication Tolerances:
   1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
   2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
   3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.
   4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

D. Cure Units as Follows:
   1. Cure units with sufficient protection from moisture evaporation to achieve specified design properties.

E. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

F. Colors and Textures: Match existing adjacent cast stone units

2.4 MORTAR MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

E. Preblended Dry Mortar Mix: Packaged blend made from portland cement and hydrated lime, sand, mortar pigments, and admixtures and complying with ASTM C1714/C1714M.

F. Aggregate for Mortar: ASTM C144.
   1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
   2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
   3. White-Mortar Aggregates: Natural white sand or crushed white stone.
   4. Colored Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Water: Potable.

2.5 ACCESSORIES

A. Anchors: Type and size indicated, fabricated from Type 316 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.

B. Dowels: 1/2-inch- diameter round bars, fabricated from Type 316 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.

C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cast stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.6 MORTAR MIXES

A. Do not use admixtures including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.
   2. Use portland cement-lime mortar unless otherwise indicated.

B. Comply with ASTM C270, Proportion Specification.
   1. For setting mortar, use Type S.
   2. For pointing mortar, use Type N.

C. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
   1. Pigments do not exceed 10 percent of portland cement by weight.
   2. Mix to match Architect's sample.
   3. Application: Use pigmented mortar for exposed mortar joints.

2.7 SOURCE QUALITY CONTROL

A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C1364.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING CAST STONE IN MORTAR

A. Set cast stone as indicated in TMS 604.

B. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
   1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
   2. Coordinate installation of cast stone with installation of flashing specified in other Sections.

C. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

D. Set units in full bed of mortar with full head joints unless otherwise indicated.
   1. Set units with joints 1/4 to 3/8 inch wide unless otherwise indicated.
   2. Build anchors and ties into mortar joints as units are set.
   3. Fill dowel holes and anchor slots with mortar.
   4. Build concealed flashing into mortar joints as units are set.
   5. Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.
   6. Keep joints at shelf angles open to receive sealant.

E. Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

F. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

G. Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.

H. Rake out joints for pointing with sealant to depths of not less than 3/4 inch. Scrub faces of units to remove excess mortar as joints are raked.

I. Point joints with sealant to comply with applicable requirements in Section 07 92 00 "Joint Sealants."
   1. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.

J. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
   1. Keep joints free of mortar and other rigid materials.
   2. Build in compressible foam-plastic joint fillers where indicated.
   3. Form joint of width indicated, but not less than 3/8 inch.
   4. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
   5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 07 92 00 "Joint Sealants."

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2 inch maximum.

B. Variation from Level: Do not exceed 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2 inch maximum.

C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.

D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.

3.4 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean cast stone as work progresses.
1. Remove mortar fins and smears before tooling joints.
2. Remove excess sealant immediately, including spills, smears, and spatter.

D. Final Repair and Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone per the cast stone manufacturers recommendations and as follows:
1. Repair chips with touchup materials furnished by cast stone manufacturer.
2. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
3. Consult with manufacturer for appropriate cleaners.
4. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
5. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
6. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
7. Clean all exposed cast stone material.

END OF SECTION 04 72 00

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Structural-steel materials.
   2. Shrinkage-resistant grout.

B. Attachments:
   1. Refer to Attachment A at the end of this Section for Existing Column Dimensions Worksheet.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Structural-steel materials.
   2. High-strength, bolt-nut-washer assemblies.
   3. Anchor rods.
   4. Threaded rods.
   5. Shop primer.
   6. Galvanized-steel primer.
   7. Etching cleaner.
   8. Galvanized repair paint.
   9. Shrinkage-resistant grout.

B. Sustainable Design Submittals:
   1. Report structural steel quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in structural steel. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.

C. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment Drawings.
   3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
   4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
   5. Identify members not to be shop primed.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

C. Mill test reports for structural-steel materials, including chemical and physical properties.

D. Product Test Reports: For the following:
   1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
   2. Direct-tension indicators.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.

E. Survey of existing conditions.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
   1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
   2. Clean and relubricate bolts and nuts that become dry or rusty before use.

3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:
1. ANSI/AISC 303.
2. ANSI/AISC 360.
3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:
1. Option 2: Fabricator's experienced steel detailer selects or completes connections in accordance with ANSI/AISC 303.
a. Select and complete connections using ANSI/AISC 360.
b. Use Allowable Stress Design; data are given at service-load level.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M, Grade 50.

B. Angles, M-Shapes, S-Shapes: ASTM A572/A572M, Grade 50.

C. Channels, Miscellaneous Chanels: ASTM A992/A992M.

D. Plate and Bar: ASTM A572/A572M, Grade 50.

E. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.

F. Steel Castings: ASTM A216/A216M, Grade WCB, with supplementary requirement S11.

G. Steel Forgings: ASTM A668/A668M.

H. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.

B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
   1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.

C. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
   1. Finish: Hot-dip zinc coating.
   2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.

D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
   1. Finish: Plain.

2.4 RODS

A. Unheaded Anchor Rods: ASTM F1554, Grade 55, weldable.
   1. Configuration: Straight.
   2. Nuts: ASTM A563 heavy-hex carbon steel.
   3. Plate Washers: ASTM A36/A36M carbon steel.
   4. Washers: ASTM F436, Type 1, hardened carbon steel.
   5. Finish: Plain.

B. Threaded Rods: ASTM A36/A36M.
   1. Nuts: ASTM A63 heavy-hex carbon steel.
   2. Washers: ASTM A36/A36M carbon steel.
   3. Finish: Plain.

2.5 FORGED-STEEL STRUCTURAL HARDWARE

A. Clevises and Turnbuckles: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1035.

B. Eye Bolts and Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1030.

C. Sleeve Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1018.

2.6 PRIMER

A. Steel Primer:
   1. Comply with the following:
   2. Section 07 81 23 “Intumescent Fire Protection.
   3. Section 09 96 00 "High-Performance Coatings."
   4. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.7 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.8 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
   1. Camber structural-steel members where indicated.
   2. Fabricate beams with rolling camber up.
   3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
   4. Mark and match-mark materials for field assembly.
   5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 3.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.9 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened unless otherwise indicated as slip critical.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.10 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
   1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
   2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.11 SHOP PRIMING

A. Shop prime steel surfaces, except the following:
   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
   2. Surfaces to be field welded.
   3. Surfaces of high-strength bolted, slip-critical connections.
   4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
   5. Galvanized surfaces unless indicated to be painted.

B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:
   1. SSPC-SP 3.

C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-SP 16.

D. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
   2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.12 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
   1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
   2. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
   3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
      a. Ultrasonic Inspection: ASTM E164.
   4. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
   1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
   1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Weld plate washers to top of baseplate.

3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
1. Joint Type: Snug tightened unless otherwise indicated as slip critical.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting:
   1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
      a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
   1. Verify structural-steel materials and inspect steel frame joint details.
   2. Verify weld materials and inspect welds.
   3. Verify connection materials and inspect high-strength bolted connections.

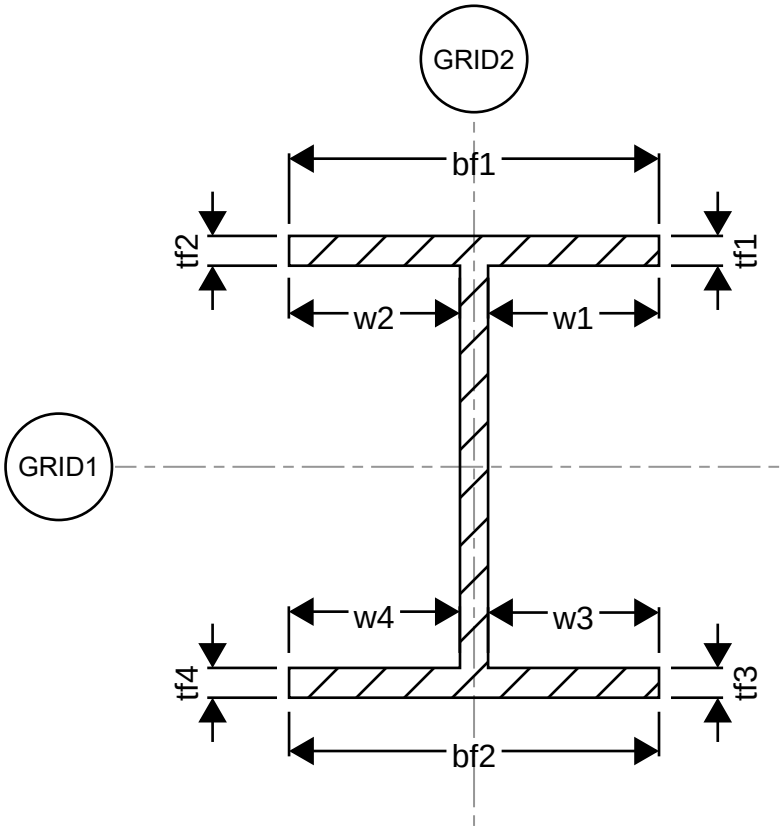
B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
   1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
   2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
      a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
         1) Ultrasonic Inspection: ASTM E164.

END OF SECTION 05 12 00

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Attachmemt A

Existing Column Dimensions Worksheet



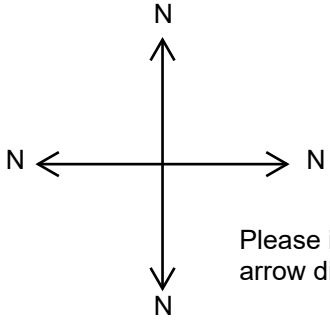
	Dimension (in)*
tf1	
tf2	
tf3	
tf4	
bf1	
bf2	
w1	
w2	
w3	
w4	

*: Provide field measurements to nearest 1/16th inch.

Column grid 1	
Column grid 2	

(or circle from the list below)

A-7	A-15	C-20	D-3	E-2
F-21	H-1	H-21	J-1	J-15
J-20	M-1	N-1	N-11	P-2
P-3	P-9	P-10	D-3	



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SECTION 05 31 00 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roof deck.
   2. Composite floor deck.
   3. Noncomposite form deck.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. Roof deck.
   2. Composite floor deck.
   3. Noncomposite form deck.

B. Shop Drawings:
   1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Qualification Statements: For welding personnel.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding codes:
   1. AWS D1.1/D1.1M.
   2. AWS D1.3/D1.3M.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.

2.2 ROOF DECK

A. Fabrication of Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:
   1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G90 zinc coating.
   2. Deck Profile: Type WR, wide rib.
   3. Profile Depth: As indicated.
   4. Design Uncoated-Steel Thickness: As indicated.
   5. Span Condition: As indicated.
   6. Side Laps: Overlapped.

2.3 COMPOSITE FLOOR DECK

A. Fabrication of Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with SDI C, with the minimum section properties indicated, and with the following:
   1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G90 zinc coating.
   2. Profile Depth: As indicated.
   3. Design Uncoated-Steel Thickness: As indicated.
   4. Span Condition: As indicated.

2.4 NONCOMPOSITE FORM DECK

A. Fabrication of Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite deck panels used as a form to comply with SDI NC, with the minimum section properties indicated, and with the following:
   1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G90 zinc coating.
   2. Profile Depth: 9/16 inch.
   3. Design Uncoated-Steel Thickness: 0.0295 inch.
   4. Side Laps: Overlapped or interlocking seam at Contractor's option.

2.5 ACCESSORIES

A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI standards for overhang and slab depth.

G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

H. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

I. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch- wide flanges and level recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.

J. Galvanizing Repair Paint: ASTM A780/A780M.

K. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Noncomposite Form Deck: Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

3.3 INSTALLATION OF ROOF DECK

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
   1. Weld Diameter and Spacing: As indicated on Drawings.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on Drawings.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
   1. End Joints: Lapped 2 inches minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld flanges to top of deck. Space welds not more than 12 inches apart with at least one weld at each corner.
   1. Install reinforcing channels or zees in ribs to span between supports and weld.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
   1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.

3.4 INSTALLATION OF FLOOR DECK

A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
   1. Weld Diameter and Spacing: As indicated on Drawings.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on Drawings.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
   1. End Joints: Lapped.

D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure in accordance with SDI recommendations unless otherwise indicated.

E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, in accordance with SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.5 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:
   1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.
      a. Field welds will be subject to inspection.
   2. Steel decking will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 05 31 00

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SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior non-load-bearing wall framing.
   2. Interior non-load-bearing wall framing.
   3. Soffit framing.

B. Where stud base-metal thickness and flange widths are indicated, these are minimum dimensions. Thicker base-metal and wider flanges may be required to satisfy design load requirements.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Cold-formed steel framing materials.
   2. Exterior non-load-bearing wall framing.
   3. Interior non-load-bearing wall framing.
   4. Vertical deflection clips.
   5. Single deflection track.
   6. Drift clips.
   7. Ceiling joist framing.
   8. Soffit framing.
   9. Post-installed anchors.
   10. Power-actuated anchors.
   11. Sill sealer gasket.

B. Sustainable Design Submittals:
   1. Report cold-formed framing quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in cold-formed faming materials. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.

C. Shop Drawings:
   1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
   2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

D. Delegated Design Submittal: For cold-formed steel framing.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
   1. Steel sheet.
   2. Expansion anchors.
   3. Power-actuated anchors.
   4. Mechanical fasteners.
   5. Vertical deflection clips.
   6. Miscellaneous structural clips and accessories.

C. Research Reports:
   1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. ClarkDietrich Building Systems.
   2. MarinoWARE.
   3. SCAFCO Steel Stud Company.
   4. Telling Industries.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design cold-formed steel framing.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
   1. Design Loads: As indicated on Drawings.
   2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
      a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/600 of the wall height.
      b. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft..
      c. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for live loads and 1/240 for total loads of the span.
   3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
   4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
      a. Upward and downward movement of 1 inch.
   5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.

D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.3 COLD-FORMED STEEL FRAMING MATERIALS

A. Framing Members, General: Comply with AISI S240 for conditions indicated.

B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
   1. Grade: ST33H.
   2. Coating: G90 or equivalent.

C. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
   1. Grade: 33.
   2. Coating: G90.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0538 inch.
   2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: Matching steel studs.
   2. Flange Width: 1-1/4 inches.

C. Vertical Deflection Clips, Exterior: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
   1. Minimum Base-Metal Thickness: 0.0538 inch.
   2. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.

2.5 INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0428 inch.
   2. Flange Width: 1-3/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: Matching steel studs.
   2. Flange Width: 1-1/4 inches.

C. Vertical Deflection Clips, Interior: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
   1. Minimum Base-Metal Thickness: 0.0428 inch.
   2. Flange Width: 1 inch plus the design gap for one-story structures.

2.6 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0538 inch.
   2. Flange Width: 1-5/8 inches, minimum.

2.7 SOFFIT FRAMING

A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
   1. Minimum Base-Metal Thickness: 0.0538 inch.
   2. Flange Width: 1-5/8 inches, minimum.

2.8 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Web stiffeners.
   4. Anchor clips.
   5. End clips.
   6. Foundation clips.
   7. Gusset plates.
   8. Stud kickers and knee braces.
   9. Hole-reinforcing plates.
   10. Backer plates.

2.9 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.

B. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
   1. Uses: Securing cold-formed steel framing to structure.
   2. Type: Torque-controlled adhesive anchor or adhesive anchor.
   3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
   4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

C. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
   1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

E. Welding Electrodes: Comply with AWS standards.

2.10 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A780/A780M.

B. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.

C. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

D. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

2.11 FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.
   2. Cut framing members by sawing or shearing; do not torch cut.
   3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.

4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.

C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

C. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
   1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 INSTALLATION OF EXTERIOR NONLOADBEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: As indicated on Drawings.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single deep-leg deflection tracks and anchor to building structure.
   2. Install double deep-leg deflection tracks and anchor outer track to building structure.
   3. Connect vertical deflection clips to bypassing studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
   1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
   2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 18 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
   1. Install solid blocking at centers indicated on Shop Drawings.

G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION OF INTERIOR NONLOADBEARING WALL FRAMING

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: As indicated on Drawings.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single deep-leg deflection tracks and anchor to building structure.
   2. Connect vertical deflection clips to studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
   1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
   1. Install solid blocking at centers indicated on Shop Drawings.

G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 INSTALLATION OF JOIST FRAMING

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
   1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
   2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections.

C. Space joists not more than 2 inches from abutting walls, and as follows:
   1. Joist Spacing: As indicated on Drawings.

D. Frame openings with built-up joist headers, consisting of joist and joist track or another combination of connected joists if indicated.

E. Install bridging at intervals indicated on Shop Drawings. Fasten bridging at each joist intersection as follows:
   1. Joist-Track Solid Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
   2. Combination Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

F. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.7 INSTALLATION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.8 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.9 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00

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SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Miscellaneous framing and supports.
   2. Metal ladders.
   3. Metal floor plate.
   4. Abrasive metal nosings, treads, and thresholds.

B. Products furnished, but not installed, under this Section include the following:
   1. Loose steel lintels.
   2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
   3. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Nonslip aggregates and nonslip-aggregate surface finishes.
   2. Fasteners.
   3. Shop primers.
   4. Shrinkage-resisting grout.
   5. Manufactured metal ladders.
   6. Abrasive metal nosings, treads, and thresholds.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates:
1. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
2. Welding certificates.
3. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

B. Research Reports: For post-installed anchors.

C. Delegated design engineer qualifications.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 316L.

D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 316L.

E. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.

F. Rolled-Stainless Steel Floor Plate: ASTM A793.

G. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

H. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.2 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

C. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 2.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.

F. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.

G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.3 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
   1. Fabricate units from slotted channel framing where indicated.
   2. Furnish inserts for units installed after concrete is placed.

C. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
   1. Unless otherwise indicated, fabricate from Schedule 40 steel pipe.
   2. Unless otherwise indicated, provide 1/2-inch baseplates with four 5/8-inch anchor bolts and 1/4-inch top plates.

D. Galvanize miscellaneous framing and supports where indicated.

E. Prime miscellaneous framing and supports with primer specified in Section 09 96 00 "High-Performance Coatings" where indicated.

2.6 METAL LADDERS

A. General:
   1. For elevator pit ladders, comply with ASME A17.1/CSA B44.

B. Steel Ladders:
   1. Space siderails 18 inches apart unless otherwise indicated.
   2. Siderails: Continuous, 3/8-by-2-1/2-inch steel flat bars, with eased edges.
   3. Rungs: 3/4-inch- diameter, steel bars.
   4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
   5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
   6. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.

2.7 METAL FLOOR PLATE

A. Fabricate from rolled-steel floor plate of thickness indicated below:
1. Thickness: 1/4 inch.

2.8 ELEVATOR PIT SUMP COVERS

A. Fabricate from 3/16-inch rolled-steel floor plate with four 1-inch- diameter holes for water drainage and for lifting.

B. Provide steel angle supports unless otherwise indicated.

2.9 ABRASIVE METAL NOSINGS; TREADS; AND THRESHOLDS

A. Cast-Metal Units: Cast iron, with an integral-abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.
1. Source Limitations: Obtain units from single source from single manufacturer.

B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.

C. Apply bituminous paint to concealed surfaces of cast-metal units.

D. Apply clear lacquer to concealed surfaces of extruded units.

2.10 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches unless otherwise indicated.

C. Galvanize and prime loose steel lintels located in exterior walls.

D. Prime loose steel lintels located in exterior walls with primer specified in Section 09 96 00 "High-Performance Coatings."

2.11 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.12 GENERAL FINISH REQUIREMENTS

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.13 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
   1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
   1. Shop prime with universal shop primer unless primers specified in Section 09 96 00 "High-Performance Coatings" are indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
   1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   3. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
   5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
   1. Cast Aluminum: Heavy coat of bituminous paint.
   2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLATION OF METAL LADDERS

A. Secure ladders to adjacent construction with the clip angles attached to the stringer.

B. Install brackets as required for securing of ladders welded or bolted to structural steel or built into masonry or concrete.

3.4 INSTALLATION OF METAL FLOOR PLATE

A. Install metal floor plates flush with finished surface. Adjust as required to avoid lippage that could present a tripping hazard.

3.5 INSTALLATION OF ELEVATOR PIT SUMP COVERS

A. Install tops of elevator sump pit cover plates and frames flush with finished surface. Adjust as required to avoid lippage that could present a tripping hazard.

3.6 INSTALLATION OF ABRASIVE METAL NOSINGS, TREADS, AND THRESHOLDS

A. Center nosings on tread widths unless otherwise indicated.

B. For nosings embedded in concrete steps or curbs, align nosings flush with riser faces and level with tread surfaces.

3.7 REPAIRS

A. Touchup Painting:
   1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
      a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 05 50 00

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SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Steel railings.
   2. Stainless steel railings.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Manufacturer's product lines of mechanically connected railings.
   2. Fasteners.
   3. Post-installed anchors.
   4. Handrail brackets.
   5. Shop primer.
   6. Nonshrink, nonmetallic grout.
   7. Metal finishes.
   8. Paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Samples for Verification: For each type of exposed finish required.
   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
   2. Fittings and brackets.
   3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
      a. Show method of connecting and finishing members at intersections.

E. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For delegated design professional engineer.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

E. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design railings, including attachment to building construction.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Infill of Guards:
      a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
      b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
   1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M, Type 5.

C. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
   1. Provide galvanized finish for exterior installations and where indicated.

D. Plates, Shapes, and Bars: ASTM A36/A36M.

E. Cast Iron Fittings: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.

2.4 STAINLESS STEEL RAILINGS

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Tubing: ASTM A554, Grade MT 316L.

C. Pipe: ASTM A312/A312M, Grade TP 316L.

D. Castings: ASTM A743/A743M, Grade CF 8M or CF 3M.

E. Plate and Sheet: ASTM A240/A240M or ASTM A666, Type 316L.

2.5 FASTENERS

A. Fastener Materials:
1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM F1941/F1941M, Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
3. Stainless Steel Railing Components: Type 316 stainless steel fasteners.
4. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.6 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast stainless steel, center of handrail 3-1/8 inches from face of railing or wall.

B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.
1. For stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

D. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with Section 09 96 00 "High-Performance Coatings."

F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
   1. Clearly mark units for reassembly and coordinated installation.
   2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.
   1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
   2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.
   1. Provide weep holes where water may accumulate.
   2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 welds; good appearance, completely sanded joint, some undercutting and pinholes okay.

I. Form changes in direction as follows:
   1. By flush bends.

J. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
   1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
   2. Coordinate anchorage devices with supporting structure.

O. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.8 STEEL AND IRON FINISHES

A. Galvanized Railings:
   1. Hot-dip galvanize indicated steel railings, including hardware, after fabrication.
   2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
   3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
   4. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
   5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner and as follows.
   1. Comply with SSPC-SP 16.

D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.

E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:
   1. Exterior Railings: SSPC-SP 6/NACE No. 3.
   2. Railings Indicated To Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3.
   3. Other Railings: SSPC-SP 3.

F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
   1. Shop prime uncoated railings with universal shop primer unless primers specified in Section 09 96 00 "High-Performance Coatings" are indicated.

2.9 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Run grain with long dimension of each piece.
   2. When polishing is completed, passivate and rinse surfaces.
   3. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Pipe and Tubing Finishes:
   1. 180-Grit Polished Finish: Uniform, directionally textured finish.

D. Stainless Steel Sheet and Plate Finishes:
   1. Directional Satin Finish: ASTM A480/A480, No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.
   1. Fit exposed connections together to form tight, hairline joints.
   2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
   3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.

4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

C. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:
1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
2. For stainless steel railings, weld flanges to post and bolt to supporting surfaces.

3.5 ATTACHING RAILINGS

A. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
1. Use type of bracket with predrilled hole for exposed bolt anchorage.

2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

B. Secure wall brackets to building construction as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.
4. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
5. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.6 CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 52 13

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SECTION 05 53 13 - BAR GRATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal bar gratings.
   2. Grating frames and supports.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. Clips and anchorage devices for gratings.
   2. Paint products.

B. Shop Drawings:
   1. Include plans, sections, and attachment details.
   2. Signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.

B. Certificates:
   1. Mill Certificates: Signed by manufacturers of stainless steel certifying that products furnished comply with requirements.
   2. Welding certificates.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
      a. AWS D1.1/D1.1M.
      b. AWS D1.3/D1.3M.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. IKG.
   2. Ohio Gratings, Inc.
   3. McNichols.
   4. Ross Technology Company.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Gratings to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Uniform load of 125 lbf/sq. ft. or concentrated load of 2000 lbf, whichever produces the greater stress.
   2. Limit deflection to L/360 or 1/4 inch, whichever is less.

2.3 METAL BAR GRATINGS

A. Metal Bar Grating Standards: Comply with NAAMM MBG 531.

B. Welded Steel Grating:
   1. Bearing Bar Spacing: 11/16 inch o.c.
   2. Bearing Bar Depth: 1-3/4 inches.
   3. Bearing Bar Thickness: 1/4 inch.
   4. Crossbar Spacing: 4 inches o.c.
   5. Traffic Surface: Serrated.
   6. Steel Finish: Hot-dip galvanized with a coating weight of not less than 1.8 oz./sq. ft. of coated surface.

2.4 GRATING FRAMES AND SUPPORTS

A. Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.
   1. Unless otherwise indicated, fabricate from same basic metal as gratings.

B. Galvanize steel frames and supports in the following locations:
   1. Exterior.

2.5 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, nuts, and, where indicated, flat washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 2.

C. Post-Installed Anchors: Torque-controlled expansion or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
   1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.7 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Steel Bars for Bar Gratings: ASTM A36/A36M or steel strip, ASTM A1011/A1011M or ASTM A1018/A1018M.

C. Wire Rod for Bar Grating Crossbars: ASTM A510/A510M.

2.8 FABRICATION

A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.

D. Fit exposed connections accurately together to form hairline joints.

E. Welding: Comply with AWS recommendations and the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.
   1. Fabricate toeplates to fit grating units and weld to units in shop unless otherwise indicated.
   2. Fabricate toeplates for attaching in the field.
   3. Toeplate Height: 4 inches unless otherwise indicated.

G. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
   1. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.

H. Do not notch bearing bars at supports to maintain elevation.

2.9 STEEL FINISHES

A. Finish gratings, frames, and supports after assembly.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

C. Fit exposed connections accurately together to form hairline joints.

D. Attach toeplates to gratings by welding at locations indicated.

E. Field Welding: Comply with AWS recommendations and the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

3.2 INSTALLATION OF METAL BAR GRATINGS

A. Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.

B. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.

C. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.

3.3 REPAIR

A. Repair of Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 05 53 13

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SECTION 05 71 00 - DECORATIVE METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes decorative metal stairs.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs.
   1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.
   2. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For metal stairs and the following:
   1. Shop primer products.
   2. Precast terrazzo treads.
   3. Grout.

B. Shop Drawings:
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
   3. Include plan at each level.

C. Samples for Verification: For each type and finish of tread.

D. Delegated Design Submittal: For stairs, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that the engineer is licensed in the State in which Project is located.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification.
   1. Keep members off ground and spaced by using pallets, dunnage, or other supports and spacers.
   2. Protect members and packaged materials from corrosion and deterioration.
   3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
      a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design stairs, including attachment to building construction.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. Structural Performance of Stairs: Metal stairs withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Uniform Load: 100 lbf/sq. ft..
   2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
   3. Uniform and concentrated loads need not be assumed to act concurrently.
   4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
   5. Limit deflection of treads, platforms, and framing members to L/720 or 1/4 inch, whichever is less.

2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Steel Tubing: ASTM A500/A500M (cold formed) or ASTM A513/A513M.

D. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.

E. Uncoated, Hot-Rolled Steel Sheet: ASTM A1011/A1011M, either commercial steel, Type B, or structural steel, Grade 30, unless another grade is required by design loads.

2.3 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls.
   1. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

C. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements.

B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

C. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

2.5 PRECAST TERRAZZO TREADS

A. Precast Terrazzo Stair Treads: Epoxy terrazzo units cast in maximum lengths possible. Comply with manufacturer's written instructions for fabricating precast terrazzo units in sizes and profiles indicated.
   1. Epoxy Resin Matrix: Manufacturer's standard, recommended for use indicated.
   2. Aggregates: Comply with NTMA gradation standards for mix indicated, and containing no deleterious or foreign matter.
      a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C131/C131M.
      b. 24-Hour Absorption Rate: Less than 0.75 percent.
      c. Dust Content: Less than 1.0 percent by weight.
   3. Reinforcement: ASTM A615/A615M, Grade 60 bars, as required by unit size, profile, and thickness.
   4. Abrasive Inserts: 1/2-inch- wide, alundum oxide/epoxy mixture.
      a. Provide three inserts, 1/2 inch apart, with first insert located 1 inch from nosing at adjacent stair riser locations.
   5. Color: As selected from manufacturer's standard color selections.
   6. Finish: Honed.
   7. Surface Sealer: Slip and stain-resistant, penetrating sealer that is chemically neutral with pH factor between 7 and 12; does not affect color or physical properties of terrazzo type indicated; is recommend by sealer manufacturer for use with specified terrazzo; and complies with NTMA guide specification for terrazzo type applicable for this Project.

2.6 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
   1. Join components by welding unless otherwise indicated.
   2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs in shop to greatest extent possible.
   1. Disassemble units only as necessary for shipping and handling limitations.
   2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.
   1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
   2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. Weld connections to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Weld exposed corners and seams continuously unless otherwise indicated.
   5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 - No evidence of a welded joint.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
   1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
   2. Locate joints where least conspicuous.

2.7 FABRICATION OF STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Architectural Class, unless more stringent requirements are indicated.

B. Stair Framing:
   1. Stringers: Fabricate of steel tubes.
      a. Stringer Size: As required to comply with "Performance Requirements" Article, but not less than indicated on Drawings.
      b. Provide closures for exposed ends of tube stringers.
      c. Finish: Shop primed.
   2. Platforms: Construct of steel rectangular tube headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.
      a. Provide closures for exposed ends of tube framing.
      b. Finish: Shop primed.
   3. Weld stringers to headers; weld framing members to stringers and headers.

C. Subtreads, Risers, and Subplatforms:
   1. Fabricate subtreads and subplatforms of steel plates.
   2. Weld subtreads to stringers.
      a. Locate welds on top of subtreads where they will be concealed by finished treads.
   3. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads.
      a. Weld subplatforms to platform framing.
      b. Locate welds on top of subplatforms where they will be concealed by finished flooring.

2.8 STAIR RAILINGS

A. Comply with applicable requirements in Section 05 73 13 "Glazed Decorative Metal Railings."

2.9 FINISHES

A. Finish metal stairs after assembly.

B. Steel Shop Prime Finish:
1. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting.
a. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLING METAL STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.
a. Clean bottom surface of plates.
b. Set plates for structural members on wedges, shims, or setting nuts.
c. Tighten anchor bolts after supported members have been positioned and plumbed.
d. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
e. Promptly pack grout solidly between bearing surfaces and plates so no voids remain.
1) Neatly finish exposed surfaces; protect grout and allow to cure.
2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry.

E. Fit exposed connections accurately together to form hairline joints.
   1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
   2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
   3. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

F. Install precast terrazzo treads according to manufacturer's written instructions.

END OF SECTION 05 71 00

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SECTION 05 73 00 – EXTERIOR DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Stainless steel illuminated decorative railings.

1.2 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Manufacturer's product lines of decorative metal railings assembled from standard components.
   2. Illuminated rails.
   3. Fasteners.
   4. Post-installed anchors.
   5. Handrail brackets.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.
   1. For illuminated railings, include wiring diagrams and roughing-in details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Samples for Verification: For each type of exposed finish required.
   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters
   2. Illuminated railing.
   3. Fittings, end caps, and brackets.
   4. Welded connections.
   5. Assembled Sample of railing system, made from full-size components, including top rail, post, illuminated handrail, and guard infill. Sample need not be full height.
      a. Show method of connecting and finishing members at intersections.

1.4 INFORMATIONAL SUBMITTALS

A. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

B. Welding certificates.

C. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.

D. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
   1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Build mockups for each form and finish of railing, consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches in length.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:
   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
   b. Infill load and other loads need not be assumed to act concurrently.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior railings by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.3 STAINLESS STEEL DECORATIVE RAILINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. C.W. Cole & Company, Inc.
   2. KLIK USA.
   3. Organic Lighting.

B. Source Limitations: Obtain stainless steel decorative railing components from single source from single manufacturer.

C. Tubing: ASTM A554, Grade MT 316L.

D. Pipe: ASTM A312/A312M, Grade TP 316L.

E. Castings: ASTM A743/A743M, Grade CF 8M or CF 3M.

F. Plate, Sheet, and Strip: ASTM A240/A240M or ASTM A666, Type 316L.

G. Flat Bar: ASTM A666, Type 316L.

H. Bars and Shapes: ASTM A276/A276M, Type 316L.

I. Illuminated Top Rails: Provide internal illumination using concealed, internally wired, integrated LED lamps to illuminate walking surfaces adjacent to railings without light leaks. Make provisions for servicing and for concealed connection to electric service.
   1. Product/Manufacturer: Basis of design.
      a. Lightrail Illuminated Handrail; C.W. Cole & Company, Inc.

b. Series: LR5.
c. Mounting: Post Mount.
d. Power Supply Location: Integral driver/ballast.
e. End Treatments: Miter end.
f. Baseplate: Round plate.
g. Lens: Frosted lens.

2. LED Luminaires:
a. Lamp Type: Linear.
b. Correlated Color Temperature: 3000 K.
c. Rated Lamp Life: 50,000 hours at 70 percent lamp illumination output.
d. Nominal Operating Voltage: 120 V ac input; [**12 V dc**] [**24 V dc**] output.
e. UL Listing: Damp.
f. IP Rating: IP67.
g. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 FASTENERS

A. Fastener Materials:
1. Stainless Steel Railing Components: Type 316 stainless steel fasteners.
2. Dissimilar Metal Railing Components: Type 316 stainless steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless otherwise indicated.
1. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, in accordance with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593 and nuts, ASTM F594.

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
1. For stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

2.6 FABRICATION

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
   1. Clearly mark units for reassembly and coordinated installation.
   2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.
   1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
   2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water.
   1. Provide weep holes where water may accumulate.
   2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.

I. Form changes in direction as follows:
   1. As detailed.

J. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch or less.

2.7 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

2.8 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Avoid iron contamination by using proper preparation, handling and cleaning procedures as recommended by the Nickel Development Institute.
   2. All surfaces contaminated with embedded iron shall be cleaned in a pickling solution. This is in addition to passivation.
   3. Run grain of directional finishes with long dimension of each piece.
   4. When polishing is completed, passivate and rinse surfaces.
   5. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Tubing Finishes:
   1. 180-Grit Polished Finish: Uniform, directionally textured finish.

D. Stainless Steel Sheet and Plate Finishes:
   1. Directional Satin Finish: ASTM A480/A480M, No. 4.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.
   1. Fit exposed connections together to form tight, hairline joints.
   2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
   3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
   4. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
   5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
   6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.3 ANCHORING POSTS

A. Anchor posts to surfaces with round baseplatesas required by conditions, connected to posts and to metal supporting members as follows:
   1. For stainless steel railings, weld flanges to posts and bolt to supporting surfaces.

3.4 CLEANING

A. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

3.5 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 73 00

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SECTION 05 73 13 - GLAZED DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Glazed decorative metal railings.

1.2 DEFINITIONS

A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor and exterior deck areas and for pedestrian guidance and support, visual separation, or wall protection.

1.3 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Metal railings assembled from standard components.
   2. Glass products.
   3. Sealant and accessories for structural glass railings.
   4. Fasteners.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Samples for Verification: For each type of exposed finish required.
   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
   2. Base channel.
   3. Each type of glass and glass edge required.
   4. Fittings and brackets.
   5. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, structural glass balusters,. Show method of finishing members at intersections. Samples need not be full height.

E. Delegated Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

C. Product Test Reports: For tests performed by a qualified testing agency, in accordance with ASTM E894, ASTM E935, ASTM E2353, and ASTM E2358.

D. Evaluation Reports: From ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
   1. For glazed decorative metal railings.
   2. For post-installed anchors.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Build mockups for each form and finish of structural glass railing consisting of top rail, structural glass, base channel, and anchorage system components that are full height and are not less than 24 inches in length.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer's Special Warranty for Laminated Glass: Glazed decorative metal railing manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design glazed decorative metal railings, including attachment to building construction.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1. Aluminum: The lesser of minimum yield strength divided by 1.65, or minimum ultimate tensile strength divided by 1.95.
   2. Stainless Steel: 60 percent of minimum yield strength.
   3. Glass: 25 percent of mean modulus of rupture (50 percent probability of breakage), as listed in "Mechanical Properties" in AAMA CW-12, "Structural Properties of Glass."

C. Structural Performance: Railings, including attachment to building construction, are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1. Handrails and Top Rails of Guards:
      a. Uniform load of 50 lbf/ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.
   2. Structural Glass Railings and Glass-Infill Panels:
      a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
      b. Infill load and other loads need not be assumed to act concurrently.
   3. For structural glass railings, support each section of top rail and handrail by a minimum of three glass panels or by other means so railings will remain in place if any one glass panel fails.
      a. Support top rail and handrail ends such that railings remains in place if end glass panel fails.

2.2 GLAZED DECORATIVE METAL RAILINGS

A. Products/Manufacturers: Basis of design.
   1. As indicated on Drawings.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Railing System Manufacturers:
      a. AGS Stainless, Inc.
      b. HDI Railing Systems.
      c. VIVA Railings, LLC.

d. Wagner Architectural Systems.

2. Glass Manufacturers:
   a. Carvart Glass.
   b. 3-Form Glass.
   c. Technoglass.
   d. Skyline Glass.

C. Source Limitations for Laminated Glass: Obtain from single source from single manufacturer.

D. Source Limitations for Decorative Metal Railing Components: Obtain from single source from single manufacturer for each component and installation method.

E. Product Options: Information on Drawings and in the Specifications establishes requirements for railing system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.4 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.

B. Extruded Bars and Shapes, Including Extruded Tube: ASTM B221, Alloy 6063-T5/T52.

C. Plate and Sheet: ASTM B209, Alloy 5005-H32.

D. Die and Hand Forgings: ASTM B247, Alloy 6061-T6.

E. Castings: ASTM B26/B26M, Alloy A356.0-T6.

2.5 STAINLESS STEEL

A. Tubing: ASTM A554, Grade MT 304.

B. Pipe: ASTM A312/A312M, Grade TP 304.

C. Castings: ASTM A743/A743M, Grade CF 8 or Grade CF 20.

D. Sheet, Strip, Plate, and Flat Bar: ASTM A666 or ASTM A240/A240M, Type 304.

E. Bars and Shapes: ASTM A276, Type 304.

2.6 GLASS AND GLAZING PRODUCTS, GENERAL

A. Glazing Publications: Comply with written instructions of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. NGA/GANA Publications: "GANA Laminated Glazing Reference Manual" and "GANA Glazing Manual."

B. Safety Glazing: Glazing is to comply with 16 CFR 1201, Category II.

C. Safety Glazing Labeling: Permanently mark glass with certification label of the SGCC. Label is to indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear), Class 1 and low-iron clear, or Class 2 (tinted) as indicated, Quality-Q3.

E. Ceramic-Coated Glass: Heat-strengthened float glass, Condition C; with ceramic enamel applied by silk-screened process; complying with Specification No. 95-1-31 in GANA's "Engineering Standards Manual" and with other requirements specified.

F. Sealant and Accessories for Structural Glass Railings: Sealant, gaskets, setting blocks, shims, and related accessories as recommended or supplied by railing manufacturer for installing structural glazing in metal base channels.

2.7 GLASS HANDRAILS AND GUARDS

A. Laminated Glass Handrails and Guards: ASTM C1172, Type II with two plies of glass bonded together by an interlayer.
   1. Construction: Laminate glass with SentryGlas Plus (SGP) to comply with interlayer manufacturer's written instructions.
   2. Interlayer Thickness: 0.060 inch.
   3. Kind: LT (laminated tempered).
   4. Glass Color: As indicated on Drawings.
   5. Ceramic Coating Color and Pattern: As indicated on Drawings.
   6. Interlayer Color: As indicated on Drawings .

2.8 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:
   1. Stainless Steel Components: Type 304 stainless steel fasteners.
   2. Dissimilar Metals: Type 304 stainless steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless exposed fasteners are the standard fastening method for railings indicated.
   1. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to design load, in accordance with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/ASTM F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.9 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast stainless steel, center of rail 3-1/8 inches from face of structural glass balusters.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.10 FABRICATION OF METAL RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
   1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

H. Form changes in direction as follows:
   1. By bending.

I. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

J. Close exposed ends of hollow railing members with prefabricated end fittings.

K. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other work where indicated.
   1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.

L. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

M. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

2.11 FABRICATION OF GLASS PANELS AND BALUSTERS

A. Fabricate glass to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.

B. Structural Glass Balusters: Provide laminated, tempered structural glass balusters for both straight and curved sections.
   1. Edge Finish: Grind smooth and flat polish exposed edges of glass, including those at open joints, to produce smooth, square edges with glass edge finishes.
   2. Fabricate structural glass balusters to maintain equal length glass widths and uniform spacing of 1/2 inch between glass balusters.

2.12 METAL FINISH REQUIREMENTS, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.13 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1. Run grain of directional finishes with long dimension of each piece.
   2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Tubing Finishes:
   1. 180-Grit Polished Finish: Uniform, directionally textured finish.

D. Stainless Steel Sheet, Strip, Plate, and Bar Finishes:
   1. Directional Satin Finish: ASTM A480/A480M, No. 4.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with Drawings and manufacturer's written instructions for installing glazed decorative metal railings, accessories, and other components.

B. Perform cutting, drilling, and fitting required for installing metal railings.
   1. Fit exposed connections together to form tight, hairline joints.
   2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.

3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of metal railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with shop primer.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 METAL RAILING CONNECTIONS

A. Nonwelded Connections:
1. Use mechanical or adhesive joints for permanently connecting railing components.
2. Use wood blocks and padding to prevent damage to railing members and fittings.
3. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Expansion Joints: Install expansion joints at locations indicated, but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.3 METAL ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

C. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
   1. For stainless steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

3.4 INSTALLATION OF GLASS BALUSTERS

A. Structural Glass Railings:
   1. Install assembly to comply with railing manufacturer's written instructions.
   2. Adjust spacing of glass balusters so gaps between balusters are equal before securing in position.
   3. Erect glass railings under direct supervision of manufacturer's authorized technical personnel.

3.5 CLEANING

A. Clean stainless steel by washing thoroughly with water and soap, rinsing with clean water, and wiping dry.

B. Clean and polish glass as recommended in writing by manufacturer. Wash both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 73 13

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood products.
   2. Wood-preservative-treated lumber.
   3. Fire-retardant-treated lumber.
   4. Miscellaneous lumber.
   5. Plywood backing panels.
   6. Engineered framing system.

1.2 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

B. Lumber grading agencies, and abbreviations used to reference them, include the following:
   1. NeLMA: Northeastern Lumber Manufacturers' Association.
   2. NLGA: National Lumber Grades Authority.
   3. SPIB: The Southern Pine Inspection Bureau.
   4. WCLIB: West Coast Lumber Inspection Bureau.
   5. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
   3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
   4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
   3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content:
   1. Dimension Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1, Use categories as follows:
   1. UC3B (Commodity Specification A): Uncoated sawn products in exterior construction not in contact with ground, exposed to all weather cycles including intermittent wetting but with sufficient air circulation for wood to dry. Excludes sawn products not in contact with ground but with ground contact-type hazards. Include the following items:
      a. Wood deck joists and beams for decks that are not critical to the performance and safety of the entire system/construction and that are in locations easily accessible for maintenance, repair, or replacement.
   2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
   3. After treatment, redry dimension lumber to 19 percent maximum moisture content.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

2.3 FIRE-RETARDANT-TREATED LUMBER

A. General: Where fire-retardant-treated materials are indicated, materials are to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
   1. Treatment is not to promote corrosion of metal fasteners.
   2. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
   3. Design Value Adjustment Factors: Treated lumber is to be tested according to ASTM D5664 and design value adjustment factors are to be calculated according to ASTM D6841.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency and other information required by authorities having jurisdiction.

E. Application: Treat all interior rough carpentry unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER

A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
   1. Blocking.
   2. Nailers.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:
   1. Hem-fir; WCLIB or WWPA.

C. Roofing Nailers: Structural- or No. 2-grade lumber or better; kiln-dried Douglas fir, or wood having similar decay-resistant properties.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 ENGINEERED FRAMING SYSTEM

A. Parapet Cap Engineered Framing System:
   1. Meets AWPA U1-15 for Use Category 2 (UC2).
   2. NAHB Research Center Green Approved.
   3. MDI resin, 100 percent waterproof when cured.
   4. Treated with zinc borate through complete cross section.
   5. Typical material 1-1/2 inches (38 mm) thick; built-up as required.
   6. Round 1-1/4 inch counter sunk anchor openings at 24 inches O.C.
   7. Acceptable for direct contact with concrete, non-corrosive to metals, insect and fungi resistive.
   8. Materials: LSL 1.30E Engineered Lumber, ICC ESR-1387.
      a. Treatment: Zinc borate through complete cross section.
      b. Bending Strength: 1900 psi.
      c. Tensile Strength: 1075 psi.
      d. Shear Strength: 150 psi.
      e. Compression - Perpendicular to Grain: 670 psi.
      f. Specific Gravity: 0.50 into the face, 0.42 into the edge.
      g. R-value of 1-1/2 inch thickness (ASTM E 518): 1.86.

2.7 FASTENERS

A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
   1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
   1. Use inorganic boron for items that are continuously protected from liquid water.
   2. Use copper naphthenate for items not continuously protected from liquid water.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
   2. ICC-ES evaluation report for fastener.

G. Securely attach roofing nailers to substrates by anchoring and fastening to withstand bending, shear, or other stresses imparted by Project wind loads and fastener-resistance loads as designed in accordance with ASCE/SEI 7.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.

3.3 INSTALLATION OF FLOOR JOIST FRAMING

A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:
   1. Where supported on wood members, by using metal framing anchors.

B. Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.

3.4 ENGINEERED FRAMING SYSTEM INSTALLATION

A. Install materials in accordance with manufacturer's recommendations and in proper relationship with adjacent construction. Set members level, plumb, and true to line.

B. Coordinate construction sequence with installation of flashings and adjacent materials provided by others to prevent exterior moisture from entering or passing through completed assemblies.

END OF SECTION 06 10 00

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall sheathing.
   2. Subflooring.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
   1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
   2. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5516.
   3. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:
   1. Fire-retardant-treated plywood.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested in accordance with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
   1. Use treatment that does not promote corrosion of metal fasteners.
   2. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
   3. Design Value Adjustment Factors: Treated lumber plywood is to be tested in accordance with ASTM D5516 and design value adjustment factors are to be calculated in accordance with ASTM D6305. Span ratings after treatment are to be not less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: Treat plywood indicated on Drawings, and the following:
   1. Subflooring and underlayment for raised platforms.

2.3 WALL SHEATHING

A. Glass-Mat Gypsum Sheathing, Walls: ASTM C1177/C1177M.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but not limited to, the following:
      a. DensGlass FireGuard Sheathing; Georgia-Pacific Gypsum LLC.
      b. GlasRoc Sheathing; CertainTeed.
      c. Gold Bond eXP Fire-Shield Sheathing; Gold Bond Building Products, LLC.
   2. Type and Thickness: Type X, 5/8 inch thick.

2.4 SUBFLOORING

A. Plywood Subflooring: Either DOC PS 1 or DOC PS 2, Exposure 1 single-floor panels or sheathing.
   1. Nominal Thickness: Not less than 3/4 inch.
   2. Edge Detail: Tongue and groove.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
   1. For wall sheathing, provide fasteners of Type 304 stainless steel.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

C. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

D. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

E. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
   1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C1002.
   2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C954.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:
   1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
   2. ICC-ES evaluation report for fastener.

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF WOOD STRUCTURAL PANEL

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:
   1. Subflooring:
      a. Glue and nail to wood framing.
      b. Screw to cold-formed metal framing.
      c. Space panels 1/8 inch apart at edges and ends.

3.3 INSTALLATION OF GYPSUM SHEATHING

A. Comply with GA-253 and with manufacturer's written instructions.
   1. Fasten gypsum sheathing to cold-formed metal framing with screws.
   2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
   3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

END OF SECTION 06 16 00

SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pegboard panels.
2. Interior bench.
3. Interior standing and running trim for transparent finish.
4. Interior frames and jambs for transparent finish.
5. Fire-retardant-treated wood material.
6. Miscellaneous materials.
7. Shop finishing.

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections, to ensure that interior architectural woodwork can be supported and installed as indicated.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
1. Anchors.
2. Adhesives.
3. Shop finishing materials.

B. Fire-Retardant Treatment: Include data and warranty information from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

C. Shop Drawings:
1. Include the following:
a. Dimensioned plans, elevations, and sections.
b. Attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including blocking and reinforcement concealed by construction and specified in other Sections.

D. Samples for Verification: For the following:
1. Lumber for Transparent Finish: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.
2. Panel Products for Transparent Finish: Not less than 12 inches wide by 24 inches long for each species and cut, finished on one side and one edge.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For architectural woodwork manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Architectural Woodwork Standards, Section 2.

B. Do not deliver interior architectural woodwork until painting and similar finish operations that might damage woodwork have been completed in installation areas.

C. Store woodwork in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
   1. Handle and store fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions.

1.7 FIELD CONDITIONS

A. Environmental Limitations without Humidity Control: Do not deliver or install interior architectural woodwork until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of the construction period.

B. Field Measurements: Where interior architectural woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
   1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being concealed by construction, and indicate measurements on Shop Drawings.

C. Established Dimensions: Where interior architectural woodwork is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL WOODWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain requirements that are more stringent than the Architectural Woodwork Standards. Comply with Contract Documents and Architectural Woodwork Standards.

2.2 CUSTOM BENCH FOR TRANSPARENT FINISH

A. Architectural Woodwork Standards Grade: Custom.

B. Wood Species and Cut:
1. Species: White oak.
2. Cut: Rift cut/rift sawn.

C. Wood Moisture Content: 5 to 10 percent.

2.3 PEGBOARD PANELS

A. Pegboard Material: Tempered hardboard, smooth finish on both sides.
1. Hardboard: ANSI A135.4, Class 1 tempered.
2. 9/32-inch holes at 1-inch on centers each way.

B. Accessories:
1. Mounting hardware appropriate for substrate and ½-inch spacers.
2. Zinc plated accessories as indicated on Drawings.

2.4 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

A. Architectural Woodwork Standards Grade: Custom.

B. Hardwood Lumber:
1. Species: White oak.
2. Cut: Rift cut/rift sawn.
3. Wood Moisture Content: 5 to 10 percent.

2.5 INTERIOR FRAMES AND JAMBS FOR TRANSPARENT FINISH

A. Architectural Woodwork Standards Grade: Custom.

B. Wood Species and Cut:
1. Species: White oak.
2. Cut: Rift cut/rift sawn.
3. Wood Moisture Content: 5 to 10 percent.

2.6 HARDWOOD SHEET MATERIALS

A. Composite Wood Products: Provide materials that comply with requirements of the Architectural Woodwork Standards for each type of interior architectural woodwork and quality grade specified unless otherwise indicated.
1. Softwood Plywood: DOC PS 1, medium-density overlay.

2. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

2.7 FIRE-RETARDANT-TREATED WOOD MATERIAL

A. Fire-Retardant-Treated Wood Materials: Where fire-retardant-treated materials are indicated, use materials complying with requirements that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products in accordance with test method indicated by a qualified testing agency.
   1. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
   1. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.

2.8 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Nailers: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage.
   1. Provide metal expansion sleeves or expansion bolts for post-installed anchors.
   2. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Installation Adhesive: Product recommended by fabricator for each substrate for secure anchorage.

2.9 FABRICATION

A. Fabricate interior architectural woodwork to dimensions, profiles, and details indicated.
   1. Ease edges to radius indicated for the following:
      a. Edges of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
      b. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site.
   1. Disassemble components only as necessary for shipment and installation.

2. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
3. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled.
   a. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting.
   b. Verify that parts fit as intended, and check measurements of assemblies against field measurements indicated on approved Shop Drawings before disassembling for shipment.

2.10 SHOP FINISHING

A. Finish interior architectural woodwork with transparent finish at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.

B. Preparation for Finishing: Comply with Architectural Woodwork Standards, Section 5 for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.
1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of interior architectural woodwork. Apply two coats to end-grain surfaces.

C. Transparent Finish:
1. Architectural Woodwork Standards Grade: Custom.
2. Finish System:
   a. 11: Polyurethane, Catalyzed.
3. Staining: Match approved sample for color.
4. Filled Finish for Open-Grain Woods: Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
5. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter in accordance with ASTM D523.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition interior architectural woodwork to humidity conditions in installation areas for not less than 72 hours prior to beginning of installation.

B. Before installing interior architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming of concealed surfaces.

3.2 INSTALLATION

A. Grade: Install interior architectural woodwork to comply with same grade as item to be installed.

B. Assemble interior architectural woodwork and complete fabrication at Project site to the extent that it was not completed during shop fabrication.

C. Install interior architectural woodwork level, plumb, true in line, and without distortion.
   1. Shim as required with concealed shims.
   2. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut interior architectural woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

F. Anchor interior architectural woodwork to anchors or blocking built in or directly attached to substrates.
   1. Secure with countersunk, concealed fasteners and blind nailing.
   2. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with interior architectural woodwork.
   3. For shop-finished items, use filler matching finish of items being installed.

G. Standing and Running Trim:
   1. Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible.
   2. Do not use pieces less than 96 inches long, except where shorter single-length pieces are necessary.
   3. Scarf running joints and stagger in adjacent and related members.
   4. Fill gaps, if any, between top of base and wall with plastic wood filler; sand smooth; and finish same as wood base if finished.
   5. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.

3.3 REPAIR

A. Repair damaged and defective interior architectural woodwork, where possible, to eliminate functional and visual defects and to result in interior architectural woodwork being in compliance with requirements of Architectural Woodwork Standards for the specified grade.

B. Where not possible to repair, replace defective woodwork.

C. Shop Finish: Touch up finishing work specified in this Section after installation of interior architectural woodwork.
   1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.4 CLEANING

A. Clean interior architectural woodwork on exposed and semiexposed surfaces.

END OF SECTION 06 40 23

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SECTION 06 41 16 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plastic-laminate-clad architectural cabinets.
   2. Cabinet hardware and accessories.
   3. Miscellaneous materials.

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
   1. Include plans, elevations, sections, and attachment details.
   2. Show large-scale details.
   3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
   4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

C. Samples for Initial Selection: For each type of exposed finish.

D. Samples for Verification: For the following:
   1. Plastic Laminates: 8 by 10 inches, for each type, color, pattern, and surface finish required.
      a. Provide one sample applied to core material with specified edge material applied to one edge.
   2. Corner Pieces:
      a. Cabinet-front frame joints between stiles and rails and at exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
      b. Miter joints for standing trim.
   3. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockups of typical architectural cabinets as shown on Drawings.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations without Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.
   1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

B. Architectural Woodwork Standards Grade: Custom.

C. Type of Construction: Frameless.

D. Door and Drawer-Front Style: Flush overlay.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ABET LAMINATI.
      b. Formica Corporation.
      c. Lamin-Art.
      d. Panolam Surface Systems.
      e. Wilsonart LLC.

F. Laminate Cladding for Exposed Surfaces:
   1. Horizontal Surfaces: Grade HGS.
   2. Vertical Surfaces: Grade HGS.
   3. Edges: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
   4. Pattern Direction: As indicated on Drawings.

G. Materials for Semiexposed Surfaces:
   1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
      a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
      b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
   2. Drawer Sides and Backs: Solid-hardwood lumber.
   3. Drawer Bottoms: Hardwood plywood.

H. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
   1. Join subfronts, backs, and sides with glued dovetail joints.

J. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. As indicated on Drawings by laminate manufacturer's designations.
   2. As selected by Architect from laminate manufacturer's full range in the following categories:
      a. Patterns, [**gloss**] [**matte**] finish.

2.2 PLASTIC-LAMINATE-CLAD SHELVING AND SUPPORT HARDWARE

A. Shelving: 3/4-inch plastic laminate clad particleboard shelving with solid front edge.
   1. Horizontal Surfaces: Grade HGS.

B. Typical Wall Shelving Supports: Knape and Vogt #180 (8") bracket; K&V 60" slotted standard #80 spaced at 2'-0" o.c. max. (min. 1'-0" from each end).

C. Heavy-Duty Wall Shelving Supports: Knape and Vogt #187 bracket; K&V 60" slotted standard #87 spaced at 2'-0" o.c. max. (min. 1'-0" from each end).

2.3 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
   1. Particleboard (Medium Density): ANSI A208.1, Grade M-2.

2.4 CABINET HARDWARE AND ACCESSORIES

A. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:
   1. Semiconcealed Hinges for Flush Doors: ANSI/BHMA A156.9, B01361.

B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening.

C. Wire Pulls: Back mounted, solid metal, 5 inches long, 2-1/2 inches deep, and 5/16 inch in diameter.

D. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

E. Shelf Rests: ANSI/BHMA A156.9, B04013; two-pin plastic with shelf hold-down clip.

F. Drawer Slides: ANSI/BHMA A156.9.
   1. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): Side mount.
      a. Type: Full overtravel extension.
      b. Material: Zinc-plated ball bearing slides.
      c. Motion Feature: Soft close dampener.
   2. Pencil drawers not more than 3 inches high and not more than 24 inches wide, provide 50 lb load capacity.
   3. General-purpose drawers more than 3 inches high, but not more than 6 inches high and not more than 24 inches wide, provide 100 lb load capacity.
   4. File drawers more than 6 inches high or more than 24 inches wide, provide 200 lb load capacity.
   5. Computer keyboard tray, provide 100 lb load capacity.

G. Door Locks: ANSI/BHMA A156.11, E07121.

H. Drawer Locks: ANSI/BHMA A156.11, E07041.

I. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

J. Grommets for Cable Passage: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
   1. Color: Black.

K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
   1. Dark, Oxidized, Satin Bronze, Oil Rubbed: ANSI/BHMA 613 for bronze base; ANSI/BHMA 640 for steel base; match Architect's sample.
   2. Satin Stainless Steel: ANSI/BHMA 630.

L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.6 FABRICATION

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
   1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
   2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 06 41 16

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SECTION 06 42 19 - PLASTIC-LAMINATE-FACED WOOD PANELING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plastic-laminate-faced wood paneling.

1.2 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plastic-laminate-faced wood paneling.
   1. Include plans, elevations, sections, and attachment details.
   2. Show details full size.
   3. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.

C. Samples for Initial Selection: For each type of plastic laminate.

D. Samples for Verification: For each type of exposed laminate, 8 by 10 inches.
   1. Provide one Sample applied to core material and with specified edge material applied to one edge.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockups of typical paneling as shown on Drawings.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver paneling until painting and similar operations that might damage paneling have been completed in installation areas. Store paneling in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations without Humidity Control: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.

C. Established Dimensions: Where paneling is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PANELING, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-faced wood paneling (decorative laminate surfacing) indicated for construction, finishes, installation, and other requirements.
   1. The Contract Documents contain requirements that are more stringent than the referenced woodwork quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

2.2 PLASTIC-LAMINATE-FACED WOOD PANELING

A. Grade: Custom.

B. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3 and the following requirements:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ABET LAMINATI.
      b. Formica Corporation.

c. Lamin-Art.
d. Panolam Surface Systems.
e. Wilsonart LLC.
2. Faces: Grade HGS.
3. Backs: Grade BKV.
4. Exposed Edges: Same as faces or Grade VGS.

C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed surfaces complying with the following requirements:
1. As indicated on Drawings by manufacturer's designations.

D. Panel Core: MDF.
1. Thickness: 3/4 inch.

E. Exposed Panel Edges: Plastic-laminate matching faces.

F. Panel Reveals: White oak trim.

G. Assemble panels by gluing and concealed fastening.

2.3 MATERIALS

A. Materials, General: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.

B. Wood Moisture Content: 5 to 10 percent.

C. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
1. MDF: ANSI A208.2, Grade 130.

2.4 INSTALLATION MATERIALS

A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.

B. Concealed panel-hanger Z-clips for attached panels to walls.

2.5 FABRICATION

A. Complete fabrication, including assembly, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

B. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition paneling to humidity conditions in installation areas.

B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install paneling to comply with quality standard grade of paneling to be installed.

B. Install paneling level, plumb, true in line, and without distortion. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.
   1. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/32 inch.

C. Anchor paneling to supporting substrate with concealed panel-hanger Z-clips. Do not use face fastening unless otherwise indicated.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective paneling, where possible, to eliminate defects. Where not possible to repair, replace paneling. Adjust for uniform appearance.

B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 42 19

SECTION 06 51 13 - FIBERGLASS REINFORCED STRUCTURAL SHAPES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes Fiberglass Reinforced Polymer (FRP) pultruded structural shapes and associated connections as indicated on the drawings; including but limited to:
   1. Fiberglass Reinforced Polymer (FRP) pultruded structural shapes.
   2. Fasteners; required for attachment of the FRP structural shapes to the structure and for attachment of FRP panels to the FRP structural shapes.

1.2 COORDINATION

A. Coordinate installation of anchorages and supports.

1.3 ACTION SUBMITTALS

A. Product Data: For glass-fiber-reinforced structural shapes.

B. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Manufacturer shall have minimum of 10 years of experience in the production of pultruded structural shapes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Product/Manufacturer: Basis of design.
   1. Pultruded structural shapes shall be manufactured by Liberty Pultrusions and shall conform to the specifications for the following products:
      a. Liberty Pultrusions Polyglas C - Fire retardant.

B. All pultruded structural shapes shall be manufactured with UV inhibitors and C/W Barrier for corrosion and weathering protection.

C. All pultruded structural shapes shall achieve a flame spread of 25 or less when tested in accordance with ASTM E-84.

D. Fasteners used for attachment of pultruded structural shapes shall be stainless steel, Type 316, of the size shown on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing glass-fiber-reinforced structural shapes to in-place construction.

3.2 STORAGE HANDLING

A. Storage and handling of pultruded structural shapes shall be done in a manner to protect against physical damage and premature contact with moisture and UV radiation. All pultruded structural shapes shall be stored to prevent breakage, cuts, cracks, bends, twists, and dents. It is recommended that the pultruded structural shapes be stored above ground and covered with a water proof, opaque material.

3.3 INSPECTION

A. Examine alignment and condition of structural steel prior to installation of pultruded structural shapes and do not proceed until the defects are corrected by the responsible contractor.

3.4 INSTALLATION

A. Comply with manufacturer's written instructions for installing glass-fiber-reinforced structural shapes.

B. All factory and field cut edges, holes and abrasions shall be field coated using a sealer compatible with the original resin as recommended by the manufacturer.

C. Pultruded structural shapes shall be installed true and square with the building structure in accordance with the drawings.

D. Fasteners shall be one of the type specified on the Drawings.

END OF SECTION 06 51 13

SECTION 06 64 00 - PLASTIC PANELING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plastic sheet paneling.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For plastic paneling and trim accessories, in manufacturer's standard sizes.

1.3 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain plastic paneling and trim accessories from single manufacturer.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Citadel Architectural Products.
   2. Crane Composites.
   3. Marlite.
   4. Nudo Products.

2.3 PLASTIC SHEET PANELING

A. Glass-Fiber-Reinforced Plastic Paneling: Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D5319.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency in accordance with ASTM E84. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 200 or less.
      b. Smoke-Developed Index: 450 or less.

3. Nominal Thickness: Not less than 0.09 inch.
4. Surface Finish: As indicated by manufacturer's designations.
5. Color: As indicated by manufacturer's designations.

2.4 ACCESSORIES

A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
   1. Color: Match panels.

B. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.

C. Adhesive: As recommended by plastic paneling manufacturer.

D. Sealant: Mildew-resistant, single-component, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.

B. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.

C. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.

D. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.

E. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
   1. Mark plumb lines on substrate at trim accessory locations for accurate installation.
   2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

A. Install plastic paneling according to manufacturer's written instructions.

B. Install panels in a full spread of adhesive.

C. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.

D. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.

E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.

F. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 06 64 00

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SECTION 06 73 00 – COMPOSITE DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Composite decking.

1.2 ACTION SUBMITTALS

A. Product Data: For decking.
   1. For preservative-treated wood products. Include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
   2. For decking. Include installation instructions.

B. Samples: For plastic decking, not less than 24 inches long, showing the range of variation to be expected in appearance of decking, including surface texture.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials under cover and protected from weather and contact with damp or wet surfaces. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Handle and store plastic lumber to comply with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 COMPOSITE DECKING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Fiberon.
   2. TimberTech.
   3. Trex Company.

B. Composite Lumber: Solid shapes made from a mixture of cellulose fiber and polyethylene or polypropylene.
   1. Product/Manufacturer: Basis of design.
      a. TimberTech Composite Terrain+ Collection; TimberTech
   2. Decking Size: 0.94-inches by 5.36-inches actual.
   3. Configuration: Provide decking with grooved edges designed for fastening with concealed decking fasteners.
   4. Surface Texture: Woodgrain.
   5. Color: As indicated by manufacturer's designations.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
   1. Use stainless steel unless otherwise indicated.
   2. For pressure-preservative-treated wood, use stainless steel fasteners.

B. Power-Driven Fasteners: ICC-ES AC70.

2.3 CONCEALED DECKING FASTENERS

A. Deck Splines: Corrosion-resistant metal splines that fit in grooves routed into the sides of decking material and are fastened to deck framing with screws. Splines provide uniform spacing of decking material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION, GENERAL

A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit work to other construction; scribe and cope as needed for accurate fit.

B. Install composite decking to comply with manufacturer's written instructions.

C. Secure decking to framing with deck splines.

END OF SECTION 06 73 00

SECTION 07 01 50.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes:
   1. Full roof tear-off.
   2. Base flashing removal.
   3. Disposal.

1.2 DEFINITIONS

A. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck or concrete fill.

B. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
      a. Reroofing preparation, including roofing system manufacturer's written instructions.
      b. Temporary protection requirements for existing roofing system components that are to remain.
      c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
      d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
      e. Existing roof deck conditions requiring Architect notification.
      f. Existing roof deck removal procedures and Owner notifications.
      g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
      h. Structural loading limitations of roof deck during reroofing.
      i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
      j. HVAC shutdown and sealing of air intakes.
      k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
      l. Asbestos removal and discovery of asbestos-containing materials.

m. Governing regulations and requirements for insurance and certificates if applicable.
n. Existing conditions that may require Architect notification before proceeding.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Photographs or Video: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.
1. Submit before Work begins.

B. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 FIELD CONDITIONS

A. Existing Roofing Systems:
1. Built-up asphalt.
2. SBS-modified bituminous roofing.
3. EPDM roofing.
4. PVC roofing .

B. Owner will occupy portions of building immediately below reroofing area.
1. Conduct reroofing so Owner's operations are not disrupted.
2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.
a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
   1. Remove only as much roofing in one day as can be made watertight in the same day.

G. Hazardous Materials:
   1. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
      a. Hazardous material remediation is specified elsewhere in the Contract Documents.
      b. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
      c. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Seal or isolate windows that may be exposed to airborne substances created in removal of existing materials.

B. Shut off rooftop utilities and service piping before beginning the Work.

C. Test existing roof drains to verify that they are not blocked or restricted.
   1. Immediately notify Architect of any blockages or restrictions.

D. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
   1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
   1. Prevent debris from entering or blocking roof drains and conductors.
      a. Use roof-drain plugs specifically designed for this purpose.
      b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
   2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
      a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.

C. Remove aggregate ballast from roofing.

D. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.

E. Remove pavers and accessories from roofing.

F. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing roof deck or concrete fill.
   1. Remove excess asphalt from steel deck.
   2. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
   1. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
   1. Do not proceed with installation until directed by Architect.

D. Replace steel deck as directed by Architect.
   1. Deck replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

3.4 BASE FLASHING REMOVAL

A. Remove existing base flashings.
   1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain.
   1. Replace metal counterflashings damaged during removal with counterflashings specified in Section 07 71 00 "Roof Specialties."

3.5 DISPOSAL

A. Collect demolished materials and place in containers.
   1. Promptly dispose of demolished materials.
   2. Do not allow demolished materials to accumulate on-site.
   3. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07 01 50.19

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SECTION 07 13 26 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Modified bituminous sheet waterproofing.
   2. Blindside sheet waterproofing.
   3. Protection course.
   4. Insulation drainage panels.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.
   2. Review transitions within waterproofing system and between waterproofing and adjacent air barrier.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
   2. Include manufacturer's written installation instructions for evaluating, preparing, and treating substrate.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, air barrier, and other termination conditions.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For Installer.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to frozen, damp, or wet substrates.
   1. Do not apply waterproofing when snow, rain, fog, or mist is present.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.7 COORDINATION

A. Coordinate Work under this Section with adjacent concrete foundation work, including fill and subdrainage systems.

B. Coordinate requirements for concrete formwork to provide suitable substrate for waterproofing and to minimize penetrations through waterproofing.

1.8 WARRANTY

A. Manufacturer's Warranty:
   1. Waterproofing Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
      a. Warranty Period: Five years from date of Substantial Completion.

B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Waterproofing System: Obtain waterproofing materials, protection course, and insulation drainage panels from single source from single manufacturer.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet Waterproofing: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil- thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Henry a Carlisle Company; MiraDRI 860/861.
      b. GCP Applied Technologies Inc.; Bituthene 3000, Bituthene 4000, or Bituthene Low Temperature.
      c. W.R. Meadows, Inc; Mel-Rol.

2. Physical Properties:
   a. Tensile Strength, Membrane: 250 psi minimum; ASTM D412, Die C, modified.
   b. Ultimate Elongation: 300 percent minimum; ASTM D412, Die C, modified.
   c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D1970/D1970M.
   d. Puncture Resistance: 40 lbf minimum; ASTM E154/E154M.
   e. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D570.
   f. Water Vapor Permeance: 0.05 perm maximum; ASTM E96/E96M, Water Method.
   g. Hydrostatic-Head Resistance: 200 ft. minimum; ASTM D5385/D5385M.
3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 BLINDSIDE SHEET WATERPROOFING

A. Blindside Sheet Waterproofing for Horizontal Applications: Uniform, flexible, multilayered-composite sheet membrane that forms a permanent bond with fresh concrete placed against it; complete with accessories and preformed shapes for an unbroken waterproofing assembly; with the physical properties as specified below:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Henry a Carlisle Company; MiraPLY.
      b. GCP Applied Technologies Inc.; Preprufe 300R-Plus.
      c. W.R. Meadows, Inc; PRECON.
   2. Physical Properties:
      a. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D1970/D1970M.
      b. Peel Adhesion to Concrete: 5 lbf/in. minimum; ASTM D903, modified.
      c. Lap Adhesion: 5 lbf/in. minimum; ASTM D1876, modified.
      d. Hydrostatic-Head Resistance: 230 ft.; ASTM D5385/D5385M, modified.
      e. Puncture Resistance: 200 lbf minimum; ASTM E154/E154M.
      f. Water Vapor Permeance: 0.1 perm maximum; ASTM E96/E96M, Water Method.
      g. Ultimate Elongation: 335 percent minimum; ASTM D412, modified.

B. Mastic, Adhesives, and Detail Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.

2.4 ACCESSORIES FOR WATERPROOFING

A. Furnish accessory materials as recommended in writing by waterproofing manufacturer for intended use and compatibility with sheet waterproofing.
   1. Furnish liquid-type accessory materials that comply with VOC limits of authorities having jurisdiction.

B. Primer: Liquid waterborne primer as recommended in writing for substrate by sheet waterproofing material manufacturer.

C. Surface Conditioner: Liquid, waterborne surface conditioner as recommended in writing for substrate by sheet waterproofing material manufacturer.

D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

F. Metal Termination Bars: Aluminum or stainless steel bars, approximately 1 by 1/8 inch, predrilled at 9-inch centers.

2.5 PROTECTION COURSE

A. Protection Course, Asphaltic: ASTM D6506/D6506M; semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
   1. Thickness: Nominal 1/8 inch.
   2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

B. Horizontal Protection Course, Extruded-Polystyrene Board Insulation, Unfaced: ASTM C578, Type VII, 60 psi minimum compressive strength, 4-inches thick.

2.6 INSULATION DRAINAGE PANELS

A. Insulation Drainage Panels, Geotextile Faced, Type VI: ASTM C578, Type VI, 40 psi minimum compressive strength extruded-polystyrene board insulation, fabricated with tongue-and-groove edges and with one side having grooved drainage channels faced with nonwoven geotextile filter fabric.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.
   1. Verify that concrete has cured and aged for minimum time recommended in writing by waterproofing manufacturer.
   2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method in accordance with ASTM D4263.
   3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean, prepare, and treat substrates in accordance with manufacturer's written installation instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections.

E. Fill form tie holes, honeycomb, aggregate pockets, holes, and other voids.

F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks in accordance with ASTM D4258.
   1. Install sheet strips of width in accordance with manufacturer's written installation instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.

G. Bridge and cover isolation joints, expansion joints, and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths in accordance with manufacturer's written installation instructions.
   1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.

H. Corners: Prepare, prime, and treat inside and outside corners in accordance with manufacturer's written installation instructions.
   1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:
      a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.

I. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.

3.3 INSTALLATION OF MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Install modified bituminous sheets in accordance with waterproofing manufacturer's written installation instructions.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
   1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.

D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

F. Seal edges of sheet waterproofing terminations with termination bar and sealant.

G. Install sheet waterproofing and accessory materials to tie into adjacent waterproofing.

H. Roll waterproofing membrane to firmly adhere to substrate. Roll seams and terminations.

I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.

J. Immediately install protection course with butted joints over waterproofing membrane.
   1. Insulation drainage panels may be used in place of a separate protection course to vertical applications when approved by waterproofing manufacturer and installed immediately.

3.4 INSTALLATION OF BLINDSIDE SHEET WATERPROOFING

A. Install blindside sheet waterproofing in accordance with manufacturer's written installation instructions.

B. Horizontal Applications: Install sheet with face against substrate. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required by membrane manufacturer. Overlap and seal seams, and stagger and tape end laps to ensure watertight installation.

C. Corners: Seal lapped terminations and cut edges of sheet waterproofing at inside and outside corners with detail tape.

D. Seal penetrations through sheet waterproofing to provide watertight seal with detail tape patches or wraps and a liquid-membrane troweling.

E. Install sheet waterproofing and accessory materials to produce a continuous watertight tie into adjacent waterproofing.

F. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Tape perimeter of damaged or nonconforming area extending 6 inches beyond repaired areas in all directions. Apply a patch of sheet waterproofing and firmly secure with detail tape.

3.5 INSTALLATION OF INSULATION DRAINAGE PANELS

A. Install insulation drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.

B. Ensure that drainage channels are aligned vertically and free of obstructions.

C. On vertical surfaces, set insulation drainage panels in adhesive or tape applied in accordance with manufacturer's written installation instructions.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components; and to furnish daily reports to Architect.

B. Waterproofing will be considered defective if it does not pass tests and inspections.

3.7 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 13 26

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SECTION 07 18 00 - TRAFFIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes traffic coatings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include installation instructions and details, material descriptions, dry or wet film thickness requirements, and finish.

B. Shop Drawings: For traffic coatings.
   1. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions that are not included in manufacturer's product data.

C. Samples for Initial Selection: For each type of exposed finish.

D. Samples for Verification: For each type of exposed finish, prepared on rigid backing.
   1. Provide stepped Samples on backing to illustrate buildup of traffic coatings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of traffic coating.

C. Field quality-control reports.

D. Sample Warranty: For manufacturer's warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For traffic coatings to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to set quality standards for materials and execution.
   1. Build mockup for each traffic coating and substrate to receive traffic coatings.
   2. Size: 200 sq. ft. of each substrate to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 deg F, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
   1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of substrate.

B. Do not install traffic coating until items that penetrate membrane have been installed.

C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 50 deg F for water-based materials, and not exceeding 95 deg F.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period with no dollar limitation.
   1. Failures include, but are not limited to, the following:
      a. Adhesive or cohesive failures.
      b. Abrasion or tearing failures.
      c. Surface crazing or spalling.
      d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
   2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Dur-A-Flex, Inc.

2. Kemper System America, Inc.
3. Tremco Commercial Sealants & Waterproofing.

B. Source Limitations:
1. Obtain traffic coatings from single source from single manufacturer.
2. Obtain primary traffic-coating materials, including primers, from traffic-coating manufacturer. Obtain accessory materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of types and from sources recommended in writing by primary material manufacturer.
3. Obtain pavement-marking paint from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Material Compatibility: Provide primers; base coat, intermediate coat, and topcoat; and accessory materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 TRAFFIC COATING

A. Traffic Coating: Manufacturer's standard, traffic-bearing, seamless, high-solids-content, cold liquid-applied, elastomeric, water-resistant reinforced membrane system with integral wearing surface.
1. Product/Manufacturer: Basis of design.
a. Kemperol 2K FR; Kemper System America, Inc.

B. Primer: Liquid primer as recommended in writing for substrate and conditions by traffic-coating manufacturer.
1. Material: Polyurethane.

C. Preparatory and Base Coats: Polyurethane.
1. Thicknesses: Minimum dry- or wet- film thickness as recommended in writing by manufacturer for substrate and service conditions indicated.

D. Polyester Reinforcing Feece: KEMPEROL 165 Fleece.

E. Intermediate Coat: Polyurethane.
1. Thicknesses: Minimum dry- or wet- film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.

F. Topcoat: Polyurethane.
1. Thicknesses: Minimum dry- or wet- film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.
2. Aggregate Content: As required to achieve slip-resistant finish.
3. Color: As selected by Architect from manufacturer's full range.

G. Aggregate: Manufacturer's standard aggregate for each use indicated of particle sizes, shape, and minimum hardness recommended in writing by traffic-coating manufacturer.

H. Fire-Test-Response Characteristics: Provide traffic-coating materials with the fire-test-response characteristics as determined by testing identical products according to test method below for deck type and slopes indicated by an independent testing and inspecting agency that is acceptable to authorities having jurisdiction.
   1. Class A roof covering according to ASTM E108.

2.4 ACCESSORY MATERIALS

A. Joint Sealants: ASTM C920.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, surface smoothness, and other conditions affecting performance of traffic-coating work.

B. Verify that substrates are visibly dry and free of moisture.
   1. Test for moisture according to ASTM D4263.
   2. Test for moisture content by method recommended in writing by traffic-coating manufacturer.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of traffic-coating work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Begin coating application only after substrate construction and penetrating work have been completed.
   2. Begin coating application only after minimum concrete-curing and -drying period recommended in writing by traffic-coating manufacturer has passed and after substrates are dry.
   3. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Clean and prepare substrates according to ASTM C1127 and manufacturer's written instructions to produce clean, dust-free, dry substrate for traffic-coating application. Remove projections, fill voids, and seal joints if any, as recommended in writing by traffic-coating manufacturer.

B. Priming: Unless manufacturer recommends in writing against priming, prime substrates according to manufacturer's written instructions.
   1. Limit priming to areas that will be covered by traffic-coating material on same day. Reprime areas exposed for more time than recommended by manufacturer.

C. Schedule preparation work so dust and other contaminants from process do not fall on wet, newly coated surfaces.

D. Mask adjoining surfaces not receiving traffic coatings to prevent overspray, spillage, leaking, and migration of coatings. Prevent traffic-coating materials from entering deck substrate penetrations and clogging weep holes and drains.

E. Concrete Substrates: Mechanically abrade surface to a uniform profile acceptable to manufacturer, according to ASTM D4259. Do not acid etch.
   1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
   2. Remove concrete fins, ridges, and other projections.
   3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
   4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D4258.

3.3 TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C1127 and manufacturer's written instructions.

B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.

C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D4258.
   1. Comply with recommendations in ASTM C1193 for joint-sealant installation.

B. Apply reinforcing strip in traffic-coating system where recommended in writing by traffic-coating manufacturer.

3.5 INSTALLATION OF TRAFFIC COATING

A. Apply traffic coating according to ASTM C1127 and manufacturer's written instructions.

B. Apply coats of specified compositions for each type of traffic coating at locations as indicated on Drawings.

C. Start traffic-coating application in presence of manufacturer's technical representative.

D. Verify that wet-film thickness of each coat complies with requirements every 100 sq. ft..

E. Roll fleece directly into the resin following manufacturer’s written installation instructions, avoiding folds and wrinkles. Use the roller or brush to work the resin into the fleece, saturating from the bottom up. The appearance of the fleece should be the color of the resin with no white spots. White spots are indications of unsaturated fleece or lack of adhesion. It is important to correct these areas before proceeding

F. Apply resin to the top of fleece to completely saturating the fleece. Rolling the fnal coat of resin onto the fleece should result in a glossy appearance. The fleece can only hold so much resin and all excess should be rolled forward to the unsaturated portion of the fleece. The correct amount of resin will completely saturate the fleece with no dry fleece visible. Work wet membrane to avoid any blisters, openings, or lifting at corners, junctions, and transitions. Always assure full resin saturation of fleece.

G. Uniformly broadcast and embed aggregate in each coat indicated to receive aggregate according to manufacturer's written instructions. After coat dries, sweep away excess aggregate.

H. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated; omit aggregate on vertical surfaces.

I. Cure traffic coatings. Prevent contamination and damage during coating application and curing.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform the following field tests and inspections:
   1. Materials Testing:
      a. Samples of material delivered to Project site are to be taken, identified, sealed, and certified in presence of Contractor.
      b. Testing agency must perform tests for characteristics specified, using applicable referenced testing procedures.
      c. Testing agency must verify thickness of coatings during traffic-coating application for each 600 sq. ft. of installed traffic coating or part thereof.

B. Final Traffic-Coating Inspection: Arrange for traffic-coating manufacturer's technical personnel to inspect membrane installation on completion.
   1. Notify Architect or Owner 48 hours in advance of date and time of inspection.

C. Waterproofing will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.7 PROTECTING AND CLEANING

A. Protect traffic coatings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 18 00

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SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Extruded polystyrene foam-plastic board insulation.
   2. Mineral-wool blanket insulation.
   3. Mineral-wool board insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Extruded polystyrene foam-plastic board insulation.
   2. Mineral-wool blanket insulation.
   3. Mineral-wool board insulation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
   3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

A. Extruded Polystyrene Board Insulation, Type X: ASTM C578, Type X, 15-psi minimum compressive strength; unfaced.
   1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
   2. Smoke-Developed Index: Not more than 450 when tested in accordance with ASTM E84.

3. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.
5. Location: Cavity wall, and continuous insulation.

B. Extruded Polystyrene Board Insulation, Type VI: ASTM C578, Type VI, 40-psi minimum compressive strength.
1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
2. Smoke-Developed Index: Not more than 450 when tested in accordance with ASTM E84.
3. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.
4. Location: Foundation wall insulation.

2.2 MINERAL-WOOL BLANKET INSULATION

A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.
3. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

B. Mineral-Wool Blanket Insulation, Reinforced-Foil Faced: ASTM C665, Type III (reflective faced); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.
3. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

2.3 MINERAL-WOOL BOARD INSULATION

A. Mineral-Wool Board Insulation, Types IA and IB, Unfaced: ASTM C612, Types IA and IB; passing ASTM E136 for combustion characteristics.
1. Nominal Density: 4 lb/cu. ft..
2. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.

4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

B. Mineral-Wool Board Insulation, Types IA and IB, Faced: ASTM C612, Types IA and IB; faced on one side with foil-scrim or foil-scrim-polyethylene vapor retarder.
1. Nominal Density: 4 lb/cu. ft..
2. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.
4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

2.4 ACCESSORIES

A. Insulation for Miscellaneous Voids:
1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer.
   1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
   2. Press units firmly against inside substrates.
   3. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 04 20 00 "Unit Masonry."

3.5 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
   1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
   2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
   4. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
      a. Exterior Walls: Set units with facing placed toward interior of construction.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
   1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.6 INSTALLATION OF CURTAIN-WALL INSULATION

A. Install board insulation in curtain-wall construction according to curtain-wall manufacturer's written instructions.
   1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass.
   2. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
   3. Install insulation to fit snugly without bowing.

3.7 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

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SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Closed-cell spray polyurethane foam insulation.
   2. Accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:
   1. Product Test Reports: For each product, for tests performed by qualified testing agency.
   2. Research Reports: For spray-applied polyurethane foam-plastic insulation, from an agency acceptable to authorities having jurisdiction showing compliance with.

B. Field Quality-Control Submittals:
   1. Field quality-control reports.

C. Qualification Statements: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 CLOSED-CELL SPRAY POLYURETHANE FOAM INSULATION

A. Closed-Cell Spray Polyurethane Foam: ASTM C1029, Type II, minimum density of 1.5 lb/cu. ft. and minimum aged R-value at 1-inch thickness of 6.2 deg F x h x sq. ft./Btu at 75 deg F.
   1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.
   2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 ACCESSORIES

A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.

B. Thermal Barrier: Material barrier intended to prevent flame-source access to foam and delay temperature-rise of foam during a fire event.
   1. Gypsum Wallboard: 0.5-inch minimum thickness.
   2. Materials tested in accordance with and complying with acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.
   3. Thermal Barrier Coating: Fire-protective intumescent coating formulated for application over polyurethane foam plastics, compatible with insulation, and passes NFPA 275 testing as part of an approved assembly.
   4. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 50 or less.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.

B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.2 INSTALLATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Spray insulation to envelop entire area to be insulated and fill voids.

C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.

D. Framed Construction: Install into cavities formed by framing members to achieve thickness indicated on Drawings.

E. Miscellaneous Voids: Apply according to manufacturer's written instructions.

F. Install thermal barrier material.
   1. Do not cover insulation prior to any required spray foam insulation inspections.

G. Apply barrier coatings in accordance with manufacturer's written instructions and to comply with requirements for listing and labeling for fire-propagation characteristics and surface-burning characteristics specified.
   1. Use equipment and techniques best suited for substrate and type of material applied as recommended by coating manufacturer.
   2. Apply coatings to prepared surfaces as soon as practical after preparation and before subsequent surface soiling or deterioration.
   3. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Produce sharp lines and color breaks.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect spray foam insulation installation, including accessories. Report results in writing.

3.4 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION 07 21 19

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SECTION 07 21 33 – THERMAL INSULATING COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and applications of fluid applied insulation and top coating system.

1.2 SYSTEM DESCRIPTION

A. The fluid applied thermal break acrylic Aerogel based material shall be applied at the required thickness to mitigate thermal bridging.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Design Data: Submit published design listings for insulation value ratings and product thickness. Include evidence that the Fluid thermal break testing was sponsored by the manufacturer and that the material tested was produced at the manufacturers facility under the supervision of technical personnel.

C. Shop Drawings: Framing plans or schedules, or both, indicating the following:
1. Extent of coating.
2. Minimum coating thicknesses needed to achieve required thermal resistance rating.

D. Samples for Verification: For each type of coating system and in each color and gloss of topcoat indicated.
1. Submit Samples on rigid backing, 8 inches square.
2. Apply coats on Samples in steps to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing product in this section with a minimum of 2 years documented experience in manufacturing insulative technology.

B. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by coating manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to manufacturer’s and specified requirements.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
   1. Storage: Materials shall be stored in strict accordance with manufacturers documented instructions.
   2. Maintain containers in clean condition, free of foreign materials and residue.
   3. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply coatings when ambient or substrate temperature is below manufacture’s requirements.

B. Ventilation: Ventilate building spaces during and after application of coatings, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until coatings dries thoroughly.

PART 2 - PRODUCTS

2.1 COATINGS

A. Product/Manufacturer: Basis of design.
   1. Primer: Tnemec 394 Perimiprime; TNEMEC
   2. Insulation Coating: Fluid Thermal Break Acrylic Aerolon Series 971; TNEMEC.
   3. Top Coat: 1029 Enduratone; TNEMEC.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

B. Cover other work subject to damage from fallout or overspray of coating materials during application.

C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by coating manufacturer.

3.3 APPLICATION

A. Apply insulation coating material at 100 mils DFT. Final DFT shall be measured with a dry film thickness gauge.

B. Apply coating systems according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
   1. Use applicators and techniques suited for coating and substrate indicated.
   2. Coat surfaces behind movable items same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed items with prime coat only.
   3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 07 21 33

SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Vapor-retarding, fluid-applied air barriers.
   2. Vapor-permeable, fluid-applied air barriers.

1.2 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.

B. Shop Drawings: For air-barrier assemblies.
   1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
   2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
   3. Include details of interfaces with other materials that form part of air barrier.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.

C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
   1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

B. Mockups: Build mockups to set quality standards for materials and execution.
   1. Build integrated mockups of exterior wall assembly as indicated on Drawings, 150 sq. ft., incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
      a. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
      b. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Protect stored materials from direct sunlight.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
   1. Protect substrates from environmental conditions that affect air-barrier performance.
   2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Carlisle Coatings & Waterproofing Inc.
   2. GCP Applied Technologies Inc.
   3. Henry Company.

2.2 MATERIALS

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.3 PERFORMANCE REQUIREMENTS

A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E2357.

2.4 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING

A. High-Build, Vapor-Retarding Air Barrier: sSynthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 40 mils or thicker over smooth, void-free substrates.
   1. Synthetic Polymer Type:
   2. Basis of Design Product: Subject to compliance with requirements, provide the following:
      a. Carlisle Coatings & Waterproofing Inc; Fire Resist Barritech NP.
   3. Physical and Performance Properties:
      a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
      b. Vapor Permeance: Maximum 0.1 perm; ASTM E96/E96M, Desiccant Method.
      c. Ultimate Elongation: Minimum 500 percent; ASTM D412, Die C.
      d. Adhesion to Substrate: Minimum 30 lbf/sq. in. when tested according to ASTM D4541.
      e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

f. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

2.5 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

A. High-Build, Vapor-Permeable Air Barrier: synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
1. Basis of Design Product: Subject to compliance with requirements, provide the following:
a. Carlisle Coatings & Waterproofing Inc; Fire Resist Barritech VP.
2. Physical and Performance Properties:
a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
b. Vapor Permeance: Minimum 10 perms; ASTM E96/E96M, Desiccant Method, Procedure A.
c. Ultimate Elongation: Minimum 200 percent; ASTM D412, Die C.
d. Adhesion to Substrate: Minimum when tested according to ASTM D4541.
1) 30 lbf/sq. in. on concrete masonry unit.
2) 12 lbf/sq. in. on Dens Glass.
e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
f. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

2.6 ACCESSORY MATERIALS

A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

C. Stainless-Steel Sheet: ASTM A240/A240M, Type 304, 0.0250 inch Insert dimension thick, and Series 300 stainless-steel fasteners.

D. Preformed Silicone Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
   1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
   2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
   3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates for capillary moisture by plastic sheet method according to ASTM D4263.
   4. Verify that masonry joints are flush and completely filled with mortar.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

H. Bridge expansion joints discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
   1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
   2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
   3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
   4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply preformed silicone extrusion so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
   1. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.

F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

H. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, transition strip.

I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
   1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
   2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
   3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
   1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils , applied in one or more equal coats.
   2. Vapor-Permeable, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.

C. Do not cover air barrier until it has been tested and inspected by testing agency.

D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.

B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
   1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
   2. Air-barrier dry film thickness.
   3. Continuous structural support of air-barrier system has been provided.
   4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
   5. Site conditions for application temperature and dryness of substrates have been maintained.
   6. Maximum exposure time of materials to UV deterioration has not been exceeded.

7. Surfaces have been primed, if applicable.
8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
9. Termination mastic has been applied on cut edges.
10. Strips and transition strips have been firmly adhered to substrate.
11. Compatible materials have been used.
12. Transitions at changes in direction and structural support at gaps have been provided.
13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
14. All penetrations have been sealed.

C. Tests: As determined by testing agency from among the following tests:
1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, chamber pressurization or depressurization with smoke tracers.
2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E783.
3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D4541 for each 2500 sq. ft. of installed air barrier or part thereof.

D. Air barriers will be considered defective if they do not pass tests and inspections.
1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION 07 27 26

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SECTION 07 42 13.13 - TONGUE AND GROOVE LINEAR ALUMINUM CLADDING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Tongue and groove linear aluminum cladding system.
   2. Aluminum battens.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
   2. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
   3. ASTM E283-04 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
   4. ASTM E331-00 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
   5. ASTM E1477 - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers (LRV).
   6. ASTM E2768-11 – Standard Test Method for Extended Duration Surface Burning Characteristics for Building Materials (30 min Tunnel Test). Results: Zero Flame Spread, Smoke Developed Index of 5. Meets criteria for Class A fire rating.

B. UL & Underwriters Laboratories of Canada (UL/ULC):
   1. UL 723, Standard Method of Test for Surface Burning Characteristics of Building Materials.
   2. AN/ULC S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
   3. CAN/ULC S114, Standard Test Method for determination of non-combustibility in building materials.

C. American Architectural Manufacturers Association (AAMA):
   1. AAMA 2605 - Voluntary Specification, Performance requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
   2. AAMA 2604 - Voluntary Specification, Performance requirements and Test Procedures for High Performing Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 509 - Voluntary Test and Classification Method for Drained and Back Ventilated Rainscreen Wall Cladding Systems.
   4. AAMA 501.1-17 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.

D. International Code Council Evaluation Service (ICC-ES):
   1. ICC-ES Evaluation Report.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
   2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
   4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
   5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
   6. Review temporary protection requirements for metal panel assembly during and after installation.
   7. Review of procedures for repair of metal panels damaged after installation.
   8. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:
   1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
   2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
   1. Include Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:
   1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish 6 pieces of full-length siding for each type installed.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.9 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical metal panel assembly as shown on Drawings, including corner, supports, attachments, and accessories.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Store, protect and handle materials and components in accordance with manufacturer’s recommendations to prevent twisting, bending, mechanical damage, contamination and deterioration.

D. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

E. Retain strippable protective covering on metal panels during installation.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.12 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.13 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including rupturing, cracking, or puncturing.
      b. Deterioration of metals and other materials beyond normal weathering.
   2. Warranty Period: Fifteen years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
   1. Wind Loads: As indicated on Drawings.
   2. Other Design Loads: As indicated on Drawings.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Knotwood Aluminum Cladding.
   2. Longboard Architectural Products.
   3. Parallel Architectural Products.

2.3 CLADDING SYSTEM

A. Product/Manufacturer: Basis of design.
   1. Tongue and Groove Linear Aluminum Cladding System: Longboard Panelboard 6-inch Smooth Planks; Longboard Architectural Products.
   2. Aluminum Battens: Longboard Link & Lock; Longboard Architectural Products.

B. Tongue and Groove Linear Aluminum Cladding and the Aluminum Battens shall be by the same manufacturer.

C. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

D. Aluminum Cladding and Components:
   1. 6-inch Panelboard Smooth planks extruded aluminum 6063 T5.
   2. Finish coating: Powder coated finish.
   3. Color: Color selected by Architect from wood grain.
   4. Gloss: 30 ± 5.
   5. Thickness: 1/16-inch base metal thickness.
   6. Profile: 6-inch Smooth by 24 feet plank.

E. Accessories: In same material and finishes as cladding.
   1. 5/8-inch Starter J-Track.
   2. 5/8-inch J-Track.
   3. 5/8-inch Two Piece J-Track.
   4. 1-3/8-inch Two Piece J-Track.
   5. 3/4-inch Inside Corner.
   6. 3-inch Outside Corner: 3-inch Smooth Corner Plank; Longboard.
   7. 2-inch Corner Set.
   8. 5/8-inch Termination Set.
   9. 1-3/8-inch Termination Set.
   10. 1-3/8-inch Compression Joint.
   11. 3/4-inch U-Reveal Set.
   12. 1-1/2-inch U-Reveal Set.
   13. 3/4-inch T&G U-Reveal.
   14. 1-1/2-inch T&G U-Reveal.
   15. 2-inch Offset Flat Reveal.

F. Plank Clips: 316 Stainless steel Quick-Screen Clips that are shipped loose for field installation.

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
   2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
   1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
   2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
   3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
   1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
   2. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
   3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
      a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Finish: Powder coated wood grain finishes are to be full sublimation wood grain finishes. Printed wood grain finishes will not be accepted.

D. Aluminum Panels and Accessories:
   1. Two-Coat Fluoropolymer: AAMA 2604. Fluoropolymer finish containing not less than 50 percent polyvinylidene fluoride (PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
   1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.

2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
   a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Shim or otherwise plumb substrates receiving metal panels.
   2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
   3. Install screw fasteners in predrilled holes.
   4. Locate and space fastenings in uniform vertical and horizontal alignment.
   5. Install flashing and trim as metal panel work proceeds.
   6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
   7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
   8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:
   1. Aluminum Panels: Use stainless steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Install all cladding planks using Quick-Screen Clips in accordance with the manufacturer's written instructions, technical bulletins, datasheets and install videos to not restrict thermal movement at specified o.c. spacings. Install screws in pre-punched holes. Install one (1) hard-fastened screw per plank, directly through the plank flange to prevent plank migration. All fasteners should penetrate into solid, secure framing or blocking.

E. Install components in accordance with the manufacturer's written instructions and shop drawings, including technical bulletins, datasheets and install videos with positive anchorage to building and provide for thermal movement.

F. Install screw fasteners using power tools having controlled torque adjusted to compress Quick-Screen Clips tight without damage or deformation of the Quick-Screen Clips, screw heads, screw threads or cladding.

G. Hard-fasten any and all butt-joints into solid secure framing or blocking, to maintain tight fitting hairline joints. Never exceed one (1) hard-fastener per plank, all other attachment points to use Quick-Screen Clips to not restrict thermal movement.

H. Do not install damaged panels; repair or replace as required.

I. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

J. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
   1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
   2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 13.13

SECTION 07 42 13.16 - METAL SIDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concealed-fastener, lap-seam metal wall panels.

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
1. Concealed-fastener, lap-seam metal wall panels.

B. Shop Drawings:
1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches**.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
1. Include Samples of trim and accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For concealed-fastener, lap-seam metal wall panels, for tests performed by a qualified testing agency.

C. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including corner, supports, attachments, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    a. Structural failures including rupturing, cracking, or puncturing.
    b. Deterioration of metals and other materials beyond normal weathering.
2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
   1. Wind Loads: As indicated on Drawings.
   2. Other Design Loads: As indicated on Drawings.
   3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than **0.06 cfm/sq. ft.** when tested according to ASTM E283 at the following test-pressure difference:
   1. Test-Pressure Difference: 1.57 lbf/sq. ft..

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ATAS International, Inc.
   2. CENTRIA, a Nucor Brand
   3. Metl-Span.
   4. Morin - A Kingspan Group Company

2.3 CONCEALED-FASTENER, LAP-SEAM METAL SIDING

A. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in laps. Include accessories required for weathertight installation.

B. Product/Manufacturer: Basis of design.
   1. Concept Series CS-200 Single Skin Wall Panel; Metl Span.

C. Flush-Profile, Concealed-Fastener Metal Wall Panels: Formed with vertical panel edges and between panel edges; with flush joint between panels.
   1. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, **G90** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, **Class AZ50** coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
      a. Nominal Thickness: 0.034 inch.
      b. Surface: Smooth.
      c. Exterior Finish: Two-coat fluoropolymer.
      d. Color: As selected by Architect from manufacturer's full range.

2.4 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, **G90** hot-dip galvanized coating designation or ASTM A792/A792M, **Class AZ50** aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
   2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
   3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
   1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch** wide and **1/8 inch** thick.
   2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
   3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.5 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
   1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
   2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
   3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
   4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
   5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
      a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.6 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:
   1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil**.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
   1. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
      a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Shim or otherwise plumb substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:
1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

E. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 feet** with no joints allowed within **24 inches** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 13.16

SECTION 07 53 23 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
2. Accessory roofing system materials.
3. Substrate board.
4. Vapor retarder.
5. Roof insulation and accessories.
6. Cover board.
7. Walkways.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and NRCA Technical Dictionary in the most current NRCA Roofing Manual: Architectural Metal Flashing and Condensation and Air Leakage Control apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Fund Coordinator, Architect, Owner's insurer if applicable, testing and inspecting agency representative, Roofing System Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Review the Specifications, Drawings, details, application requirements, staging areas, crane set-up locations, storage areas, protection and safety precautions, and what work is to be completed before the roofing operation begins.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
   1. Layout and thickness of insulation.
   2. Base and sheet flashings and membrane termination details.
   3. Flashing details at penetrations.
   4. Tapered insulation layout, thickness, and slopes.
   5. Roof plan showing orientation of roof deck and orientation of roofing membrane, fastening spacings, and pattern for corner, perimeter, and field-of-roof locations.
   6. Roof membrane field seam layout for use during installation.
   7. Insulation attachment patterns for corner, perimeter, and field-of-roof locations.
   8. Crickets, saddles, and tapered edge strips, including slopes.
   9. Tie-in with adjoining wall system air barrier.

C. Wind-Uplift-Resistance Submittal: For roofing system, indicating compliance with wind-uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates:
   1. Performance Requirement Certificate: Signed by roofing membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
      a. Submit evidence of complying with specified performance requirements.
   2. Special Warranty Certificate: Signed by roofing membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Installer Certificates: Submit letter of certification from the roofing manufacturer which certifies the roofing contractor is authorized to install the manufacturer’s roofing system and list foremen who received training from manufacturer along with dates training was received.

C. Product Test Reports: For roofing membrane and insulation, tests performed by an independent qualified testing agency, indicating compliance with specified requirements.

D. Field quality-control reports.

E. Qualification Data: For roofing system Installer and manufacturer.

F. Sample warranties.

G. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the Architect and Owner prior to issuance of the manufacturers, warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system.

B. Product and patching procedures needed to maintain warranty.

C. Provide manufacturer requirements for warranty inspections and recommended maintenance schedule/practices.

D. Provide roof repair kit and training for use.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed, listed in FM Approvals' RoofNav, or listed in SPRI's "Directory of Roof Assemblies" for roofing system identical to that used for this Project.
   1. Manufactured shall have ten years' experience in the manufacture and supply of waterproof membranes and roofing materials.

B. Installer Qualifications: A qualified firm that is approved, authorized, certified, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty. The installing firm shall be an authorized installer prior to the bidding process.

C. Manufacturer's Field Supervision: Manufacturer's technical representative to make a minimum of four site visits per month to ensure that the work is performed in accordance with manufacturer's requirements. The technical representative to have a minimum of five years of EPDM roofing inspection experience and be authorized to make decisions for manufacturer. Full time salesman or employees of distributors will not be accepted as technical representatives.
   1. A copy of the technical representative's inspection report is to be submitted to the Owner and Architect on the same day as the inspection.
   2. Observe first two (2) days of installation.
   3. Observe two (2) other non-sequential full days of installation selected by the Consultant.
   4. If work of other trades may occur after roofing is installed, review the temporary protective coverings for compliance with manufacturer's recommendations, guidelines for best practices.
   5. Inspect completed installations and provide written acceptance for each completed installation.
   6. Review the post completion infrared scan of the completed roof areas and make a written recommendation on the impact (if any) of the results on the Warranty.
   7. Inspect the work during the acceptance walk of this project with the Contractor, Installer, Campus, Consultant and the Fund.

8. In addition, after an inspected portion of the system is worked upon in this Contract by other trades or otherwise exposed to damage from the work of other trades, the advisor shall inspect the system again, upon request of the Consultant.
9. All the above inspections shall be performed and completed prior to issuing any Warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing system materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
1. Protect stored liquid material from direct sunlight.
2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
1. Store in a dry location.
2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle, store, and place equipment in a manner to avoid permanent deflection of deck.

E. Provide storage and protection of roofing and insulation materials at the site. Any materials exposed to water or snow in any way will be rejected and removed from the site. Any other damaged materials will also be rejected and removed.

F. Unless approved by the Consultant, storage of removed or new materials on the roof shall not be permitted.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written installation instructions and warranty requirements.

B. No roofing work is to be done during inclement weather. Temperature shall be 40°F and rising. No roofing work will be done unless roof deck is completely dry, free from any water, dew, frost, ice or snow.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Total roof system warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, substrate board, vapor retarders, roofing accessories, counterflashings, adhesives, sealants, metal termination bars, flexible walkways pads, and other components of roofing system.
   2. Metal edge flashing materials as specified in Section 07 71 00.
   3. Manufactured Roof Expansion Joints as specified In Section 07 71 29.
   4. Warranty shall include any roof materials in its total roof system warranty if those materials were purchased from the roofing manufacturer, approved by the roofing manufacturer for their application and installed by its certified roof applicator.
   5. Wind speed Coverage: Peak gust wind speed 90 mph, measured at 10 meters (32.81 feet) above ground.
   6. Monetary limits: No Dollar Limit, NDL.
   7. Warranty Period: 25 years from date of Substantial Completion.

B. Manufacturer shall be required to inspect the roofing system at years 2 (two), 5 (five), ten (ten) and fifteen (15) of the warranty period, and report conditions to the Owner.

C. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain components for roofing system from roofing membrane manufacturer or manufacturer approved by roofing membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing system and base flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing system and flashings to remain watertight.
   1. Accelerated Weathering: Roofing membrane to withstand 2000 hours of exposure when tested in accordance with ASTM G152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roofing membrane to resist impact damage when tested in accordance with ASTM D3746/D3746M, ASTM D4272/D4272M, or the Resistance to Foot Traffic Test in FM Approvals 4470.

B. The roofing assembly shall have been successfully tested by a qualified testing agency following ANSI/FM 4474 to resist the design uplift pressures calculated according to the following:
   1. American Society of Civil Engineers (ASCE 7).
   2. Building Code of New York State.
   3. ANSI/SPRI WD-1 “Wind Design Standard Practice for Roofing Assemblies”.

C. Material Compatibility: Roofing system materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

D. Wind-Uplift Resistance: Design roofing system to resist the following wind-uplift pressures when tested in accordance with FM Approvals 4474, UL 580, or UL 1897.

E. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
   1. As indicated on the Drawings.

F. Exterior Fire-Test Exposure: Class A; for application and roof slopes indicated; when tested by a qualified testing agency in accordance with ASTM E108 or UL 790.
   1. Identify products with appropriate markings of applicable testing agency.

G. Provide products and details to comply with membrane manufacturer’s warranty requirements.

2.3 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING SYSTEM

A. EPDM Roofing Membrane Sheet: ASTM D4637/D4637M, Type II, scrim or fabric internally reinforced, EPDM sheet.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Carlisle Syntec Systems.
      b. Elevate; Holcim Building Envelope.
      c. Johns Manville; a Berkshire Hathaway company.
   2. Thickness: 75 mils, nominal.
   3. Exposed Face Color: Black.

2.4 ACCESSORY ROOFING SYSTEM MATERIALS

A. General: Accessory materials as recommended in writing by roofing membrane manufacturer for intended use and compatible with other roofing system components.
   1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Base and Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as roofing membrane.

C. Protection Sheet: As recommended in writing by roofing membrane manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.

D. Prefabricated Pipe Flashings: As recommended in writing by roofing membrane manufacturer.

E. Bonding Adhesive: Roofing membrane manufacturer's standard.

F. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 6-inch- wide minimum, butyl splice tape with release film.

G. Cover Strip: 9-inch wide, 60 mil think cover strip of cured EPDM over membrane seams.

H. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.

I. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

J. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

K. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.

L. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing system components to substrate; tested for required pullout strength, and acceptable to roofing membrane manufacturer.

M. Miscellaneous Accessories: As recommended in writing by roofing membrane manufacturer.

2.5 SUBSTRATE BOARD

A. Glass-Mat Gypsum Roof Substrate Board: Water-resistant gypsum board.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
         1) Georgia-Pacific Building Products; Dens Deck Prime.
      b. Substrate Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate, 1/2 inch thick.
         1) USG Corporation; Securock Gypsum-Fiber Roof Board.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate panel to roof deck.

2.6 VAPOR RETARDER

A. Rubberized-Asphalt-Sheet Vapor Retarder, Self-Adhering: ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor retarder manufacturer. Vapor retarder shall be capable to act as a temporary roof.

B. Vapor Retarder Primer:
1. Manufacturer's recommended primer approved for vapor-retarder application.

2.7 ROOF INSULATION AND ACCESSORIES

A. General: Preformed roof insulation boards manufactured or approved by roofing membrane manufacturer.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2 coated glass-fiber facer on both major surfaces.
1. Compressive Strength: Grade 2, 20 psi.
2. Size: 48 by 48 inches.

C. Tapered Insulation: Provide factory-tapered insulation boards.
1. Material: Match roof insulation.
2. Minimum Thickness: 1/4 inch.
3. Slope:
a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

D. Foam plastic insulation satisfactorily passes NFPA 276 or UL 1256.

E. General: Roof insulation accessories as recommended in writing by insulation manufacturer for intended use and compatibility with other roofing system components.
1. Insulation Adhesive: Insulation manufacturer's standard adhesive formulated to attach roof insulation to substrate and to another insulation layer as follows:
a. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

F. Insulation for Miscellaneous Voids:
1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

2.8 COVER BOARD

A. General: Cover board as recommended in writing by roofing membrane manufacturer for intended use and compatible with other roofing system components.

B. Glass-Mat Gypsum Cover Board: Water-resistant gypsum substrate.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
         1) Georgia-Pacific Building Products; Dens Deck Prime.
      b. Cover Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate, 1/2 inch thick.
         1) USG Corporation; Securock Gypsum-Fiber Roof Board.
   2. Size: 48 by 48 inches.

2.9 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
   1. Size: Approximately 30 by 30 inches.
   2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Roofing System Installer present, for compliance with requirements and other conditions affecting performance of the Work.
   1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
   2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
   4. Verify that roof deck, concrete roof deck, and substrates are visibly dry and free of moisture.
   5. Minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer when tested in accordance with ASTM F2170.
      a. Test Frequency: One test probe per each 1000 sq. ft., or portion thereof, of roof deck, with not less than three test probes.
      b. Submit test reports within 24 hours of performing tests.
   6. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
   7. Verify that minimum curing period recommended by roof system manufacturer for lightweight insulating concrete roof decks has passed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation in accordance with roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Prime surface of concrete deck with primer in accordance with roofing system manufacturer's written installation instructions and allow primer to dry.

3.3 INSTALLATION OF ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING SYSTEM, GENERAL

A. Install roofing system materials and components in accordance with roofing system manufacturer's written installation instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Substrate-Joint Penetrations: Prevent adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSTALLATION OF SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
   1. Install substrate board at right angle to flutes of steel roof deck. Locate end joints over crests of steel roof deck.
   2. Tightly butt substrate boards together.
   3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
   4. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof in accordance with roofing system manufacturers' written installation instructions.
   5. At roof decks other than steel deck, adhere substrate board. Set layer of substrate board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining substrate board in place. Spacing of bead-applied adhesive as indicated on Drawings.

3.5 INSTALLATION OF VAPOR RETARDER

A. Install vapor retarder in a single layer over roof area in accordance with manufacturer's written installation instructions, side and end lapping each sheet a minimum of 2 and 6 inches, respectively.
   1. Apply primer to the substrate following vapor-retarder manufacturer’s recommendations.
   2. Surfaces to receive vapor retarder must be clean and dry. Prime all surfaces to receive the vapor retarder. Reprime if area becomes dirty.
   3. Apply Vapor Retarder from low to high point, in a shingle fashion, so that laps will shed water. End laps shall be staggered. Place membrane carefully so as to avoid wrinkles and fishmouths. Immediately after installation, roll with a 100-150 pound weighted steel roller.
   4. Extend vertically up parapet walls and projections to a minimum height equal to height of insulation and cover board.
   5. Continuously seal side and end laps with tape.

B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.6 INSTALLATION OF ROOF INSULATION AND ACCESSORIES

A. Coordinate installation of roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

B. Comply with roofing system and insulation manufacturer's written installation instructions. Install minimum of two layers of insulation under area of roofing to achieve required thickness.

C. Install each layer of insulation with joints staggered not less than 24 inches in adjacent rows and offset not less than 12 inches from previous layer.
   1. Trim insulation neatly to fit around penetrations and projections, and to fit tightly to intersecting sloping roof decks.
   2. Make joints between adjacent insulation boards not more than 1/4 inch in width.
   3. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
   4. Trim insulation, so that water flow is unrestricted.
   5. Fill gaps exceeding 1/4 inch with insulation.
   6. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
   7. Adhere insulation board. Set each layer of insulation board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining substrate board in place. Spacing of bead-applied adhesive as indicated on Drawings.
   8. Secure insulation to resist specified uplift pressure at corners, perimeter, and field of roof.

3.7 INSTALLATION OF COVER BOARD

A. Install cover board over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
   1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
   2. At internal roof drains, conform to slope of drain sump.
      a. Trim cover board so that water flow is unrestricted.
   3. Cut and fit cover board tight to nailers, projections, and penetrations.
   4. Adhere cover board to substrate using adhesive according to manufacturer’s instructions for specified Wind Resistance:
      a. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place. Spacing of bead-applied insulation adhesive as indicated on Drawings.

3.8 INSTALLATION OF EPDM ROOFING MEMBRANE

A. Install roofing membrane over roof area for adhered application method in accordance with roofing system manufacturer's written installation instructions.

B. Unroll roofing membrane and allow it to relax before installing.

C. Start installation in presence of roofing system manufacturer's technical personnel.

D. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

E. Adhered Application: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply to splice area of roofing membrane.
   1. In addition to adhering, mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roof area.

F. Tape Seam Installation: Clean and prime both faces of splice areas and apply splice tape.
   1. Firmly roll side and end laps of overlapping roofing membrane to ensure a watertight seam installation.
   2. Apply lap sealant and seal exposed edges of roofing terminations.

G. Repair tears, voids, and lapped seams in roofing membrane that do not comply with requirements.
   1. Significant roof patching shall be replaced with new work.

H. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roofing membrane in place with clamping ring.

I. Membrane seams and system joints must be at least three (3) feet away from roof drains.

J. Adhere protection sheet over roofing membrane at locations indicated.

3.9 INSTALLATION OF BASE AND SHEET FLASHINGS

A. General: Install and adhere base and sheet flashings and preformed flashing accessories to substrates in accordance with roofing system manufacturer's written installation instructions.

B. Apply bonding adhesive to substrate and underside of flashings at required rate and allow to partially dry. Do not apply to seam area of flashings.

C. Flash penetrations and field-formed inside and outside corners.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping flashings to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of terminations.

E. Terminate and seal top of flashings and mechanically anchor to substrate through termination bars.

3.10 INSTALLATION OF WALKWAYS

A. Flexible Walkways: Install walkway products in accordance with manufacturer's written installation instructions.
   1. Install flexible walkways at the following locations:
      a. Locations indicated on Drawings.
      b. As required by roofing membrane manufacturer's warranty requirements.
   2. Provide 6-inch clearance between adjoining pads.
   3. Adhere walkway products to substrate with compatible adhesive in accordance with roofing system manufacturer's written instructions.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, and installation of roofing membrane, flashings, protection, and drainage components, and to furnish reports to Architect.

B. Perform the following tests:
   1. Infrared Thermography Testing: Testing agency surveys entire roof area using infrared color thermography in accordance with ASTM C1153. Perform tests before overlying construction is placed.
      a. After infrared scan, locate specific areas of leaks by electrical capacitance/impedance testing or nuclear hydrogen detection testing.
      b. After testing, repair leaks, repeat tests, and make further repairs until roofing and flashing installations are watertight.

1) Cost of retesting is Contractor's responsibility.

c. Testing agency to prepare survey report of initial scan indicating locations of entrapped moisture, if any.

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

E. After completion of all work on roof, the contractor shall demonstrate to the Fund/College that the roof drains are functional.

F. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.12 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and in accordance with warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.13 ROOFING SYSTEM INSTALLER'S WARRANTY (Template)

A. WHEREAS _____ of _____, herein called the "Roofing System Installer," has performed roofing and associated Work on the following Project:

1. Owner: <Insert name of Owner>.
2. Owner Address: <Insert address>.
3. Building Name/Type: <Insert information>.
4. Building Address: <Insert address>.
5. Area of Work: <Insert information>.
6. Acceptance Date: _____.
7. Warranty Period: Two years from date of Substantial Completion.
8. Date of Substantial Completion: _____.

B. AND WHEREAS Roofing System Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said Work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing System Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing System Installer's own cost and expense, make or cause to be made such repairs to or replacements of said Work as are necessary to correct faulty and defective work and as are necessary to maintain said Work in a watertight condition.

D. The Roofing System Installer guarantees that the total roofing installation, together with all related composition flashings, plastic flashings, metal flashings, roof insulation, cover boards, substrate boards, any vapor seal, cants, blocking, adhesives and seals installed in connection with same, will be watertight and free from defects as to materials, installation, and/or workmanship, for a period of two (2) years from the date of acceptance of the completed project.

E. During the 2-year guarantee period, the Contractor agrees that within 24 hours of receipt of notice from the Fund, he will inspect and make immediate emergency repairs to defects or to leaks in roof system, and that within a reasonable time, he will restore the affected items to the standard of the original specifications.

F. All emergency and permanent work during the life of the Contractor's guarantee will be done without cost to the Fund, except in the event it is determined that such leaks were caused by abuse, lightning, hurricane, tornado, hailstorm, other unusual climatic phenomena of the elements, or failure of adjacent or related work previously installed by others.

G. Any work completed under the contractor’s guarantee period shall be coordinated with roofing system manufacturer warrantee so as not to void manufacturers warrantee.

H. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to Work and other parts of the building, and to building contents, caused by:
      a. lightning;
      b. peak gust wind speed exceeding 90 mph;
      c. fire;
      d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the Work;
      f. vapor condensation on bottom of roofing; and
      g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. Roofing System Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of Work.
3. During Warranty Period, if Owner allows alteration of Work by anyone other than Roofing System Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty will become null and void on date of said alterations, but only to the extent said alterations affect Work covered by this Warranty. If Owner engages Roofing System Installer to perform said alterations, Warranty will not become null and void unless Roofing System Installer, before starting said Work, will have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate Work, thereby reasonably justifying a limitation or termination of this Warranty.
4. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty will become null and void on date of said change, but only to the extent said change affects Work covered by this Warranty.
5. Owner will promptly notify Roofing System Installer of observed, known, or suspected leaks, defects, or deterioration and will afford reasonable opportunity for Roofing System Installer to inspect Work and to examine evidence of such leaks, defects, or deterioration.
6. This Warranty is recognized to be the only warranty of Roofing System Installer on said Work and will not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty will not operate to relieve Roofing System Installer of responsibility for performance of original Work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

I. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.
   1. Authorized Signature: _____.
   2. Name: _____.
   3. Title: _____.

END OF SECTION 07 53 23

SECTION 07 54 19 - POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Adhered polyvinyl chloride (PVC) roofing system.
2. Accessory roofing system materials.
3. Substrate board.
4. Vapor retarder.
5. Roof insulation and accessories.
6. Cover board.
7. Walkways.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and NRCA Technical Dictionary in the most current NRCA Roofing Manual: Architectural Metal Flashing and Condensation and Air Leakage Control apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with Owner, Fund Coordinator, Architect, Owner's insurer if applicable, testing and inspecting agency representative, Roofing System Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Review the Specifications, Drawings, details, application requirements, staging areas, crane set-up locations, storage areas, protection and safety precautions, and what work is to be completed before the roofing operation begins.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
   1. Layout and thickness of insulation.
   2. Base and sheet flashings and membrane termination details.
   3. Flashing details at penetrations.
   4. Tapered insulation layout, thickness, and slopes.
   5. Roof plan showing orientation of roof deck and orientation of roofing membrane, fastening spacings, and patterns for corner, perimeter, and field-of-roof locations.
   6. Roof membrane field seam layout for use during installation.
   7. Insulation attachment patterns for corner, perimeter, and field-of-roof locations.
   8. Crickets, saddles, and tapered edge strips, including slopes.
   9. Tie-in with adjoining wall system air barrier.

C. Samples for Verification: For the following products:
   1. Roofing membrane and flashings, of color required.

D. Wind-Uplift-Resistance Submittal: For roofing system, indicating compliance with wind-uplift performance requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates:
   1. Performance Requirement Certificate: Signed by roofing membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
      a. Submit evidence of compliance with specified performance requirements.
   2. Special Warranty Certificate: Signed by roofing membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Installer Certificates: Submit letter of certification from the roofing manufacturer which certifies the roofing contractor is authorized to install the manufacturer’s roofing system and list foremen who received training from manufacturer along with dates training was received.

C. Product Test Reports: For roofing membrane and insulation, tests performed by an independent qualified testing agency indicating compliance with specified requirements.

D. Field quality-control reports.

E. Qualification Data: For roofing system Installer and manufacturer.

F. Sample warranties.

G. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the Architect and Owner prior to issuance of the manufacturers, warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system.

B. Product and patching procedures needed to maintain warranty.

C. Provide manufacturer requirements for warranty inspections and recommended maintenance schedule/practices.

D. Provide roof repair kit and training for use.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed, listed in FM Approvals' RoofNav, or listed in SPRI's "Directory of Roof Assemblies" for roofing system identical to that used for this Project.
   1. Manufactured shall have ten years' experience in the manufacture and supply of waterproof membranes and roofing materials.

B. Installer Qualifications: A qualified firm that is approved, authorized, certified, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty. The installing firm shall be an authorized installer prior to the bidding process.

C. Manufacturer's Field Supervision: Manufacturer's technical representative to make a minimum of four site visits per month to ensure that the work is performed in accordance with manufacturer's requirements. The technical representative to have a minimum of five years of EPDM roofing inspection experience and be authorized to make decisions for manufacturer. Full time salesman or employees of distributors will not be accepted as technical representatives.
   1. A copy of the technical representative's inspection report is to be submitted to the Owner and Architect on the same day as the inspection.
   2. Observe first two (2) days of installation.
   3. Observe two (2) other non-sequential full days of installation selected by the Consultant.
   4. If work of other trades may occur after roofing is installed, review the temporary protective coverings for compliance with manufacturer's recommendations, guidelines for best practices.
   5. Inspect completed installations and provide written acceptance for each completed installation.
   6. Review the post completion infrared scan of the completed roof areas and make a written recommendation on the impact (if any) of the results on the Warranty.

7. Inspect the work during the acceptance walk of this project with the Contractor, Installer, Campus, Consultant and the Fund.
8. In addition, after an inspected portion of the system is worked upon in this Contract by other trades or otherwise exposed to damage from the work of other trades, the advisor shall inspect the system again, upon request of the Consultant.
9. All the above inspections shall be performed and completed prior to issuing any Warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing system materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
1. Protect stored liquid material from direct sunlight.
2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
1. Store in a dry location.
2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle, store, and place equipment in a manner to avoid permanent deflection of deck.

E. Provide storage and protection of roofing and insulation materials at the site. Any materials exposed to water or snow in any way will be rejected and removed from the site. Any other damaged materials will also be rejected and removed.

F. Unless approved by the Consultant, storage of removed or new materials on the roof shall not be permitted.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written installation instructions and warranty requirements.

B. No roofing work is to be done during inclement weather. Temperature shall be 40°F and rising. No roofing work will be done unless roof deck is completely dry, free from any water, dew, frost, ice or snow.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
   1. Total roof system warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, substrate board, vapor retarders, roofing accessories, counterflashings, adhesives, sealants, metal termination bars, flexible walkways pads, and other components of roofing system.
   2. Metal edge flashing materials as specified in Section 07 71 00.
   3. Manufactured Roof Expansion Joints as specified In Section 07 71 29.
   4. Warranty shall include any roof materials in its total roof system warranty if those materials were purchased from the roofing manufacturer, approved by the roofing manufacturer for their application and installed by its certified roof applicator.
   5. Wind speed Coverage: Peak gust wind speed 90 mph, measured at 10 meters (32.81 feet) above ground.
   6. Monetary limits: No Dollar Limit, NDL.
   7. Warranty Period: 30 years from date of Substantial Completion.

B. Manufacturer shall be required to inspect the roofing system at years 2 (two), 5 (five), ten (ten) and fifteen (15) of the warranty period, and report conditions to the Owner.

C. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain components for roofing system from roofing membrane manufacturer or manufacturer approved by roofing membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing system and flashings to remain watertight.
   1. Accelerated Weathering: Roofing membrane to withstand 2000 hours of exposure when tested in accordance with ASTM G152, ASTM G154, or ASTM G155.
   2. Impact Resistance: Roofing membrane to resist impact damage when tested in accordance with ASTM D3746/D3746M, ASTM D4272/D4272M, or the Resistance to Foot Traffic Test in FM Approvals 4470.

B. The roofing assembly shall have been successfully tested by a qualified testing agency following ANSI/FM 4474 to resist the design uplift pressures calculated according to the following:
   1. American Society of Civil Engineers (ASCE 7).
   2. Building Code of New York State.
   3. ANSI/SPRI WD-1 “Wind Design Standard Practice for Roofing Assemblies”.

C. Material Compatibility: Roofing system materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

D. Wind-Uplift Resistance: Design roofing system to resist the following wind-uplift pressures when tested in accordance with FM Approvals 4474, UL 580, or UL 1897.

E. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
   1. As indicated on the Drawings.

F. Exterior Fire-Test Exposure: Class A; for application and roof slopes indicated; when tested by a qualified testing agency in accordance with ASTM E108 or UL 790.
   1. Identify products with appropriate markings of applicable testing agency.

G. Provide products and details to comply with membrane manufacturer’s warranty requirements.

2.3 POLYVINYL CHLORIDE (PVC) ROOFING SYSTEM

A. PVC-Ketone Ethylene Ester (KEE)-Alloy Roofing Membrane Sheet: ASTM D4434/D4434M, fabric reinforced.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Carlisle Syntec Systems.
      b. Duro-Last; Holcim Solutions and Products US, LLC.
      c. Flex Membrane International Corp.
      d. GAF
   2. Classification: Type III.
   3. Nominal Thickness: 80 mil.
   4. Exposed Face Color: As selected by Architect from manufacturer’s standard white, gray or tan colors.

2.4 ACCESSORY ROOFING SYSTEM MATERIALS

A. General: Accessory materials as recommended in writing by roofing membrane manufacturer for intended use and compatible with other roofing system components.
   1. Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Base and Sheet Flashings: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as roofing membrane.

C. Prefabricated Pipe Flashings: As recommended in writing by roofing membrane manufacturer.

D. Bonding Adhesive: Roofing membrane manufacturer's standard.

E. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

F. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.

G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing system components to substrate, tested for required pullout strength, and acceptable to roofing membrane manufacturer.

H. Miscellaneous Accessories: As recommended in writing by roofing membrane manufacturer.

2.5 SUBSTRATE BOARD

A. Glass-Mat Gypsum Roof Substrate Board: Water-resistant gypsum board.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
a. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
1) Georgia-Pacific Building Products; Dens Deck Prime.
b. Substrate Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate, 1/2 inch thick.
1) USG Corporation; Securock Gypsum-Fiber Roof Board.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

2.6 VAPOR RETARDER

A. Rubberized-Asphalt-Sheet Vapor Retarder, Self-Adhering: ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor retarder manufacturer. Vapor retarder shall be capable to act as a temporary roof.

B. Vapor Retarder Primer:
   1. Manufacturer's recommended primer approved for vapor-retarder application.

2.7 ROOF INSULATION AND ACCESSORIES

A. General: Preformed roof insulation boards manufactured or approved by roofing membrane manufacturer.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2 glass-fiber mat facer on both major surfaces.
   1. Compressive Strength: Grade 2, 20 psi.
   2. Size: 48 by 48 inches.

C. Tapered Insulation: Provide factory-tapered insulation boards.
   1. Material: Match roof insulation.
   2. Minimum Thickness: 1/4 inch.
   3. Slope:
      a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
      b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

D. Foam plastic insulation satisfactorily passes NFPA 276 or UL 1256.

E. General: Roof insulation accessories as recommended in writing by insulation manufacturer for intended use and compatibility with other roofing system components.
   1. Insulation Adhesive: Insulation manufacturer's standard adhesive formulated to attach roof insulation to substrate and to another insulation layer as follows:
      a. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

F. Insulation for Miscellaneous Voids:
   1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

2.8 COVER BOARD

A. General: Cover board as recommended in writing by roofing membrane manufacturer for intended use and compatible with other roofing system components.

B. Glass-Mat Gypsum Cover Board: Water-resistant gypsum substrate.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
         1) Georgia-Pacific Building Products; Dens Deck Prime.
      b. Cover Board: ASTM C 1278/C 1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate, 1/2 inch thick.

1) USG Corporation; Securock Gypsum-Fiber Roof Board.

2. Size: 48 by 48 inches.

2.9 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
   1. Size: Approximately 30 by 30 inches.
   2. Color: Contrasting with roofing membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Roofing System Installer present, for compliance with requirements and other conditions affecting performance of the Work.
   1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
   2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
   4. Verify that roof deck, concrete roof deck, and substrate is visibly dry and free of moisture.
   5. Minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer, when tested in accordance with ASTM F2170.
      a. Test Frequency: One test probe per each 1000 sq. ft., or portion thereof, of roof deck, with no fewer than three test probes.
      b. Submit test reports within 24 hours of performing tests.
   6. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
   7. Verify that minimum curing period recommended by roofing system manufacturer for lightweight insulating concrete roof decks has passed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation in accordance with roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Prime surface of concrete deck with primer in accordance with roofing system manufacturer's written installation instructions and allow primer to dry.

3.3 INSTALLATION OF POLYVINYL-CHLORIDE (PVC) ROOFING SYSTEM, GENERAL

A. Install roofing system materials and components in accordance with roofing system manufacturer's written installation instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.

C. Substrate-Joint Penetrations: Prevent adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.4 INSTALLATION OF SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
   1. Install substrate board at right angle to flutes of steel roof deck. Locate end joints over crests of steel roof deck.
   2. Tightly butt substrate boards together.
   3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
   4. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof in accordance with roofing system manufacturers' written installation instructions.
   5. At roof decks other than steel deck, adhere substrate board. Set layer of substrate board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining substrate board in place. Spacing of bead-applied adhesive as indicated on Drawings.

3.5 INSTALLATION OF VAPOR RETARDER

A. Install vapor retarder in a single layer over roof area in accordance with manufacturer's written installation instructions, side and end lapping each sheet a minimum of 2 and 6 inches, respectively.
   1. Apply primer to the substrate following vapor-retarder manufacturer’s recommendations.
   2. Surfaces to receive vapor retarder must be clean and dry. Prime all surfaces to receive the vapor retarder. Reprime if area becomes dirty.
   3. Apply Vapor Retarder from low to high point, in a shingle fashion, so that laps will shed water. End laps shall be staggered. Place membrane carefully so as to avoid wrinkles and fishmouths. Immediately after installation, roll with a 100-150 pound weighted steel roller.

4. Extend vertically up parapet walls and projections to a minimum height equal to height of insulation and cover board.
5. Continuously seal side and end laps with tape.

B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.6 INSTALLATION OF ROOF INSULATION AND ACCESSORIES

A. Coordinate installation of roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

B. Comply with roofing system and insulation manufacturer's written installation instructions. Install minimum of two layers of insulation under area of roofing to achieve required thickness.

C. Install each layer of insulation with joints staggered not less than 24 inches in adjacent rows and offset not less than 12 inches from previous layer.
1. Trim insulation neatly to fit around penetrations and projections, and to fit tightly to intersecting sloping roof decks.
2. Make joints between adjacent insulation boards not more than 1/4 inch in width.
3. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
4. Trim insulation, so that water flow is unrestricted.
5. Fill gaps exceeding 1/4 inch with insulation.
6. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
7. Adhere insulation board. Set each layer of insulation board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining substrate board in place. Spacing of bead-applied adhesive as indicated on Drawings.
8. Secure insulation to resist specified uplift pressure at corners, perimeter, and field of roof.

3.7 INSTALLATION OF COVER BOARD

A. Install cover board over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
2. At internal roof drains, conform to slope of drain sump.
   a. Trim cover board so that water flow is unrestricted.
3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Adhere cover board to substrate using adhesive according to manufacturer’s instructions for specified Wind Resistance:
   a. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place. Spacing of bead-applied insulation adhesive as indicated on Drawings.

3.8 INSTALLATION OF PVC ROOFING MEMBRANE

A. Install roofing membrane over roof area for adhered application method in accordance with roofing system manufacturer's written installation instructions.

B. Unroll roofing membrane and allow it to relax before installing.

C. Start installation in presence of roofing system manufacturer's technical personnel.

D. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

E. Adhered Application: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply to splice area of roofing membrane.
   1. In addition to adhering, mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

F. Seams and End Laps: Clean seam areas, overlap membrane, and hot-air-weld side seams and end laps of roofing membrane and sheet flashing to ensure a watertight installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane and sheet flashings.
   2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.

G. Repair tears, voids, and lapped seams in roofing membrane that do not comply with requirements.
   1. Significant roof patching shall be replaced with new work.

H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

I. Membrane seams and system joints must be at least three (3) feet away from roof drains.

3.9 INSTALLATION OF BASE AND SHEET FLASHINGS

A. General: Install and adhere base and sheet flashings and preformed flashing accessories to substrates in accordance with roofing system manufacturer's written installation instructions.

B. Apply bonding adhesive to substrate and underside of flashings at required rate and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners.

D. Clean seam areas, overlap, and firmly roll flashings into the adhesive. Hot-air-weld side seams and end laps to ensure a watertight installation.

E. Terminate and seal top of flashings and mechanically anchor to substrate through termination bars.

3.10 INSTALLATION OF WALKWAYS

A. Flexible Walkways: Install walkway products in accordance with manufacturer's written instructions.
   1. Install flexible walkways at the following locations:
      a. Locations indicated on Drawings.
      b. As required by roofing membrane manufacturer's warranty requirements.
   2. Provide 6-inch clearance between adjoining pads.
   3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive in accordance with roofing system manufacturer's written instructions.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspect substrate conditions, surface preparation, and application of roofing membrane, flashings, protection, and drainage components, and to furnish reports to Architect.

B. Perform the following tests:
   1. Infrared Thermography Testing: Testing agency surveys entire roof area using infrared color thermography in accordance with ASTM C1153. Perform tests before overlying construction is placed.
      a. After infrared scan, locate specific areas of leaks by electrical capacitance/impedance testing or nuclear hydrogen detection testing.
      b. After testing, repair leaks, repeat tests, and make further repairs until roofing and flashing installations are watertight.
         1) Cost of retesting is Contractor's responsibility.
      c. Testing agency to prepare survey report of initial scan indicating locations of entrapped moisture, if any.

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
   1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

E. After completion of all work on roof, the contractor shall demonstrate to the Fund/College that the roof drains are functional.

F. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.12 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and in accordance with warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.13 ROOFING SYSTEM INSTALLER'S WARRANTY (Template)

A. WHEREAS _____ of _____, herein called the "Roofing System Installer," has performed roofing and associated Work on the following Project:
   1. Owner: <Insert name of Owner>.
   2. Owner Address: <Insert address>.
   3. Building Name/Type: <Insert information>.
   4. Building Address: <Insert address>.
   5. Area of Work: <Insert information>.
   6. Acceptance Date: _____.
   7. Warranty Period: Two years from date of Substantial Completion.
   8. Date of Substantial Completion: _____.

B. AND WHEREAS Roofing System Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said Work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing System Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing System Installer's own cost and expense, make or cause to be made such repairs to or replacements of said Work as are necessary to correct faulty and defective work and as are necessary to maintain said Work in a watertight condition.

D. The Roofing System Installer guarantees that the total roofing installation, together with all related composition flashings, plastic flashings, metal flashings, roof insulation, cover boards, substrate boards, any vapor seal, cants, blocking, adhesives and seals installed in connection with same, will be watertight and free from defects as to materials, installation, and/or workmanship, for a period of two (2) years from the date of acceptance of the completed project.

E. During the 2-year guarantee period, the Contractor agrees that within 24 hours of receipt of notice from the Fund, he will inspect and make immediate emergency repairs to defects or to leaks in roof system, and that within a reasonable time, he will restore the affected items to the standard of the original specifications.

F. All emergency and permanent work during the life of the Contractor's guarantee will be done without cost to the Fund, except in the event it is determined that such leaks were caused by abuse, lightning, hurricane, tornado, hailstorm, other unusual climatic phenomena of the elements, or failure of adjacent or related work previously installed by others.

G. Any work completed under the contractor’s guarantee period shall be coordinated with roofing system manufacturer warrantee so as not to void manufacturers warrantee.

H. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to Work and other parts of the building, and to building contents, caused by:
      a. lightning;
      b. peak gust wind speed exceeding 90 mph;
      c. fire;
      d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the Work;
      f. vapor condensation on bottom of roofing; and
      g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
   2. Roofing System Installer is responsible for damage to Work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of Work.
   3. During Warranty Period, if Owner allows alteration of Work by anyone other than Roofing System Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty will become null and void on date of said alterations, but only to the extent said alterations affect Work covered by this Warranty. If Owner engages Roofing System Installer to perform said alterations, Warranty will not become null and void unless Roofing System Installer, before starting said Work, will have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate Work, thereby reasonably justifying a limitation or termination of this Warranty.
   4. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty will become null and void on date of said change, but only to the extent said change affects Work covered by this Warranty.

5. Owner will promptly notify Roofing System Installer of observed, known, or suspected leaks, defects, or deterioration and afford reasonable opportunity for Roofing System Installer to inspect Work and to examine evidence of such leaks, defects, or deterioration.
6. This Warranty is recognized to be the only warranty of Roofing System Installer on said Work and will not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty will not operate to relieve Roofing System Installer of responsibility for performance of original Work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

I. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.
   1. Authorized Signature: _____.
   2. Name: _____.
   3. Title: _____.

END OF SECTION 07 54 19

SECTION 07 71 00 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Copings.
   2. Roof-edge specialties.
   3. Reglets and counterflashings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.
   1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
   2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
   3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
   4. Detail termination points and assemblies, including fixed points.
   5. Include details of special conditions.

C. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

D. Samples for Verification:
   1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
   2. Include roof-edge specialties made from 12-inch lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Test Reports: For roof-edge flashings, for tests performed by a qualified testing agency.

C. Sample Warranty: For manufacturer's special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class.

B. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section 07 53 23 – EPDM Roofing.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.
   1. Build mockup of typical roof edge as shown on Drawings.
   2. Build mockup of typical roof edge, including fascia, approximately 10 feet long, including 90-degree outside corner, supporting construction, seams, attachments, and accessories.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 53 23 – EPDM Roofing.

B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
   1. Design Pressure: As indicated on Drawings.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COPINGS

A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
   1. Product/Manufacturer: Basis of design.
      a. Continuous Cleat Coping System, OMG, Inc.
   2. Formed Aluminum Sheet Coping Caps: Aluminum sheet, 0.063 inch thick.
      a. Surface: Smooth, flat finish.
      b. Finish: Two-coat fluoropolymer.
      c. Color: As selected by Architect from manufacturer's full range.
   3. Corners: Factory mitered and continuously welded.
   4. Coping-Cap Attachment Method: Snap-on , fabricated from coping-cap material.

a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.

2.3 ROOF-EDGE SPECIALTIES

A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure single-ply roof membrane. Provide matching corner units.
1. Product/Manufacturer: Basis of design.
   a. TerminEdge Fascia; Hickman Edge Systems.
2. Formed Aluminum Sheet Fascia Covers: Aluminum sheet, 0.050 inch thick.
   a. Surface: Smooth, flat finish.
   b. Finish: Two-coat fluoropolymer.
   c. Color: As selected by Architect from manufacturer's full range.
3. Corners: Factory mitered and mechanically clinched and sealed watertight.
4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
5. Receiver: Galvanized-steel sheet, nominal 0.032-inch thickness.
6. Fascia Accessories: Fascia extenders with continuous hold-down cleats.

B. One-Piece Drip Edge: Manufactured, one-piece, metal drip edge in section lengths not exceeding 12 feet, with a horizontal flange and vertical leg fascia terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop. Provide matching corner units.
1. Formed Aluminum Sheet Gravel Stops: Aluminum sheet, 0.050 inch thick.
   a. Surface: Smooth, flat finish.
   b. Finish: Two-coat fluoropolymer.
   c. Color: As selected by Architect from manufacturer's full range.
2. Corners: Factory mitered and mechanically clinched and sealed watertight.
3. Accessories: Fascia extenders with continuous hold-down cleats.

2.4 REGLETS AND COUNTERFLASHINGS

A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
1. Stainless Steel: 0.0250 inch thick.
2. Corners: Factory mitered and continuously welded.
3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
4. Masonry Type, Embedded: Provide reglets with offset top flange for embedment in masonry mortar joint.

B. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:
1. Stainless Steel: 0.0250 inch thick.

C. Accessories:
   1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
   2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

D. Stainless Steel Finish: ASTM A480/A480M No. 2B (bright, cold rolled, unpolished).

2.5 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation.

B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

2.6 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
   1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
   2. Fasteners for Aluminum: Series 300 stainless steel.
   3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
   4. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel.

B. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

2.7 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Coil-Coated Aluminum Sheet Finishes:
   1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
   1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
   2. Provide uniform, neat seams with minimum exposure of solder and sealant.
   3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
   4. Torch cutting of roof specialties is not permitted.
   5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
   1. Coat concealed side of uncoated aluminum and stainless steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

3.3 INSTALLATION OF COPINGS

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at 30-inch centers .

3.4 INSTALLATION OF ROOF-EDGE SPECIALTIES

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 INSTALLATION OF REGLETS AND COUNTERFLASHINGS

A. Coordinate installation of reglets and counterflashings with installation of base flashings.

B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.

C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.6 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 71 00

SECTION 07 72 73 – ROOF EDGE PROTECTION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes non-penetrating roof edge fall protection systems.

1.2 REFERENCES

A. Occupational Safety and Health Administration (OSHA) 29 CFR 1910.29 - Subpart D, Walking-Working Surfaces; Fall Protection Systems and Falling Object Protection.

B. ASTM Standard E985 Standard Specification for Permanent Metal Railing Systems and Rails for Buildings (withdrawn 2005).

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Certification: Provide manufacturer's certifications that the ultimate strength of the fall protection system is equal to or greater than those specified.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: minimum of 15 years experience manufacturing portable railing systems.

B. Installer Qualifications: Minimum 2 person crew capable of positioning and installing portable roof fall protection system according to manufacturers instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store and maintain products in accordance with the manufacturer's printed recommendations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Garlock Safety Systems.
   2. Kee Industrial Products, Inc.
   3. BlueWater.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Comply with requirements of applicable local, state, and federal codes.
   1. 29 CFR 1910.29 - Occupational Health and Safety Standards for General Industry, Subpart D Fall Protection Systems and Falling Object Protection.
   2. ASTM Standard E985 Standard Specification for Permanent Metal Railing Systems and Rails for Buildings (withdrawn 2005) Maximum Allowable Deflection under test conditions specified in section 7.1 and 7.2.

B. Structural performance of cable and stanchion supports:
   1. Capable of withstanding a concentrated load of 200 pounds, applied to the top rail at any point and in any direction.
   2. Capable of withstanding a uniform load of 50 pounds per linear foot applied to the top rail horizontally with a simultaneous load of 100 pounds per linear foot applied vertically downward.
   3. Design need not provide for both concentrated and uniform loads to be applied concurrently.

C. Structural performance of railing infill:
   1. Capable of withstanding a horizontal concentrated load of 200 pounds, applied to one foot square area at any point on the infill.
   2. Infill includes cable, intermediate posts and other elements.
   3. Design need not provide for infill loads to be applied concurrently with top rail loading.

2.3 EQUIPMENT

A. Product/Manufacturer: Basis of design.
   1. RailGuard 200; Garlock Safety Systems.
   2. Customizable, non-penetrating safety guardrail system with weighted base.

B. Description:
   1. Standard rail section 16 gauge welded steel.
   2. Rails: 1.625-inch O.D. 16 gage wall HREW tubing.
   3. Height: 42 inches.
   4. Mid-rail: 20 inches.
   5. Finish: Epoxy powder coated color as selected by Architect.

C. Gate System; 1-5/8-inch O.D. by 0.120-inch wall HREW tubing.
   1. Height: 42 inches.
   2. Mid-rail: 20 inches.
   3. Finish: Epoxy powder coated color as selected by Architect.
   4. Support wheel: positive locking mechanism with ability to swing right or left.

D. Base Plates.
   1. Material: Cast iron class 20B.
   2. Size: 1 foot 9-1/2 inches by 1 foot 9-1/2 inches.

3. Carrying handles: built in with a center carrying hook for base transporter.
4. Toeboard receptacles: two, built in.
5. Capacity: two railing sections and be able to accommodate adapter to support three or four intersecting rails on the same base.
6. Holes: Holes for permanent mounting and round holes for pins securing base to rail.
7. Bottom of base must have a concave recess no less than 125 square inches to reduce rocking on uneven surfaces.
8. Base plate must provide no less than 5 inches of leading-edge substrate contact as concentrated load is applied to base.
9. Finish: Epoxy powder coated color as selected by Architect.
10. Four adhesive pads with directional non-skid resistant ridge pattern and minimum 28 sq. inches of substrate contact each shall be adhered to the bottom of base plate to resist slippage on hard surfaces.

E. Base Transporter.
1. Cart shall be able to carry individual base plates easily.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Before installation, inspect all parts to insure no damaged parts are used.

C. Install diagonal braces on corner stanchions and at terminations of cable runs.

D. Where there is a danger of falling materials onto someone below insert a steel Speed Board into the toeboard bracket on the base plate and secure with securing pins to base.

E. Use an outrigger at any interruption in continuous railing sections. Outrigger assembly consists of a 5-foot railing with base plate pinned to railing and placed 90 degrees away from danger side of continuous railing.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 72 73

SECTION 07 72 83 - METAL LADDERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Metal ladders.
2. Metal ship ladder / parapet crossover ladder.

1.2 COORDINATION

A. Coordinate installation of metal ladders that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

B. Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design ladders.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. Structural Performance of Aluminum Ladders: Aluminum ladders, including landings, shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. ACL Industries, Inc.
   2. O'Keeffe's Inc.
   3. Precision Ladders, LLC.

2.3 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

C. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

D. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

E. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

2.4 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use Select fasteners for type, grade, and class required.
   1. Provide stainless-steel fasteners for fastening aluminum.

B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.

C. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
   1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 METAL LADDERS

A. General:
1. Comply with ANSI A14.3.

B. Aluminum Ladders:
1. Space siderails 18 inches apart unless otherwise indicated.
2. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
3. Rungs: Extruded-aluminum square-shaped tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.
4. Fit rungs in centerline of siderails; fasten by welding or with stainless-steel fasteners or brackets and aluminum rivets.
5. Provide platforms as indicated fabricated from pressure-locked aluminum bar grating or extruded-aluminum plank grating, supported by extruded-aluminum framing. Limit openings in gratings to no more than 1/2 inch in least dimension.
6. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted aluminum brackets.
7. Provide minimum 72-inch-high, hinged security door with padlock hasp at foot of ladder to prevent unauthorized ladder use.

2.7 ALUMINUM SHIPS' LADDERS / PARAPET CROSSOVER LADDER

A. General:
1. Comply with OSHA standards.

B. Provide aluminum ships' ladders where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.
1. Treads shall be not less than 5 inches exclusive of nosing or less than 8-1/2 inches including the nosing, and riser height shall be not more than 9-1/2 inches.
2. Fabricate ships' ladders, including railings from aluminum.
3. Fabricate treads from extruded aluminum-alloy tread plate.

C. Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
a. Uniform load of 50 lbf/ ft.applied in any direction.
b. Concentrated load of 200 lbfapplied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
a. Concentrated load of 50 lbfapplied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

2.8 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

3.2 ADJUSTING AND CLEANING

A. Aluminum Surfaces: Clean field welds, bolted connections, and abraded areas and repair finish.

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SECTION 07 81 00 - APPLIED FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sprayed fire-resistive materials.

1.2 DEFINITIONS

A. SFRM: Sprayed fire-resistive materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review products, design ratings, restrained and unrestrained conditions, densities, thicknesses, bond strengths, and other performance requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Sprayed fire-resistive material.
   2. Substrate primers.
   3. Bonding agent.
   4. Metal lath.
   5. Reinforcing fabric.
   6. Reinforcing mesh.

B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
   1. Extent of fire protection for each construction and fire-resistance rating.
   2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
   3. Minimum sprayed fire-resistive material thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard dimensions in size.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of sprayed fire-resistive material.

C. Evaluation Reports: For sprayed fire-resistive material, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

B. Mockups: Build mockups to set quality standards for materials and execution.
   1. Build mockup of each type of fire protection and different substrate and each required finish as shown on Drawings.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on field mockups of fire protection.
   1. Provide test specimens and assemblies representative of proposed materials and construction.

B. Preconstruction Adhesion and Compatibility Testing: Test for compliance with requirements for specified performance and test methods.
   1. Bond Strength: Test for cohesive and adhesive strength according to ASTM E736. Provide bond strength indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
   2. Density: Test for density according to ASTM E605. Provide density indicated in referenced fire-resistance design, but not less than minimum specified in Part 2.
   3. Verify that manufacturer, through its own laboratory testing or field experience, attests that primers or coatings are compatible with sprayed fire-resistive material.
   4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   5. For materials failing tests, obtain sprayed fire-resistive material manufacturer's written instructions for corrective measures including the use of specially formulated bonding agents or primers.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 44 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.

B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fire protection dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Source Limitations: Obtain fire protection from single source.

C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Steel members are to be considered unrestrained unless specifically noted otherwise.

D. VOC Content: For field applications, verify coatings comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Primers, Sealers, and Undercoaters: 100 g/L.

E. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS - CONCEALED

A. Sprayed Fire-Resistive Material, Concealed locations: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Carboline Company; a subsidiary of RPM International; AD Southwest Fireproofing Type 5GP.
   b. GCP Applied Technologies Inc.; Grace Construction Products; Monokote MK-6 Series.
   c. Isolatek International; Cafco 300.
2. Bond Strength: Minimum 150-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E736.
3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker, but not less than 0.375 inch.
5. Combustion Characteristics: ASTM E136.

6. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   a. Flame-Spread Index: 10 or less.
   b. Smoke-Developed Index: 10 or less.
7. Compressive Strength: Minimum 1200 psf according to ASTM E761.
8. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
9. Deflection: No cracking, spalling, or delamination according to ASTM E759.
10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E859.
12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G21.
13. Finish: Spray-textured finish.

2.3 SPRAYED FIRE-RESISTIVE MATERIALS - EXPOSED

A. Sprayed Fire-Resistive Material, Exposed Locations and in Mechanical Rooms: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Carboline Company; a subsidiary of RPM International; Pyrocrete 40.
      b. GCP Applied Technologies Inc.; Grace Construction Products; Monokote Z-106 Series.
      c. Isolatek International; Cafco 400.
   2. Bond Strength: Minimum 2000 psf- cohesive and adhesive strength based on field testing according to ASTM E736.
   3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
   4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker, but not less than 0.375 inch.
   5. Combustion Characteristics: ASTM E136.
   6. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 10 or less.
      b. Smoke-Developed Index: 10 or less.
   7. Compressive Strength: Minimum 100 lbf/sq. in. according to ASTM E761.
   8. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
   9. Deflection: No cracking, spalling, or delamination according to ASTM E759.
   10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
   11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E859.

12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G21.
13. Sound Absorption: NRC as indicated on Drawings according to ASTM E795.
14. Finish: As selected by Architect from manufacturer's standard finishes.
    a. Color: As selected by Architect from manufacturer's full range.

2.4 AUXILIARY MATERIALS

A. Provide auxiliary materials that are compatible with sprayed fire-resistive material and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by sprayed fire-resistive material manufacturer and complying with one or both of the following requirements:
1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
2. Primer's bond strength in required fire-resistance design complies with specified bond strength for sprayed fire-resistive material and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E736.

C. Bonding Agent: Product approved by sprayed fire-resistive material manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.

D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and sprayed fire-resistive material manufacturer's written instructions. Include clips, lathing accessories, corner beads, steel wire lath hangers, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.

E. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by sprayed fire-resistive material manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.

2. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.

B. Verify that concrete work on steel deck is complete before beginning Work.

C. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning Work.

D. Conduct tests according to sprayed fire-resistive material manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.

B. Clean substrates of substances that could impair bond of fire protection.

C. Prime substrates where included in fire-resistance design and where recommended in writing by sprayed fire-resistive material manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fire protection. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

A. Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fire protection Work.

B. Comply with sprayed fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
   1. Do not begin applying fire protection until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
   2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.

D. Metal Decks:
   1. Do not apply fire protection to underside of metal deck substrates until concrete topping, if any, is completed.
   2. Do not apply fire protection to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fire protection.

E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and sprayed fire-resistive material manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer.

F. Spray apply fire protection to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.

G. Extend fire protection in full thickness over entire area of each substrate to be protected.

H. Install body of fire protection in a single course unless otherwise recommended in writing by sprayed fire-resistive material manufacturer.

I. Where sealers are used, apply products that are tinted to differentiate them from fire protection over which they are applied.

J. Provide a uniform finish complying with description indicated for each type of fire protection material and matching finish approved for required mockups.

K. Cure fire protection according to sprayed fire-resistive material manufacturer's written instructions.

L. Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.

M. Finishes: Where indicated, apply fire protection to produce the following finishes:
   1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
   2. Spray-Textured Finish: Finish left as spray applied with no further treatment.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Test and inspect as required by the IBC , as indicated on Schedule of Special Inspections.

B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fire protection for the next area until test results for previously completed applications of fire protection show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.

C. Fire protection will be considered defective if it does not pass tests and inspections.
   1. Remove and replace fire protection that does not pass tests and inspections, and retest.
   2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

3.6 PROTECTION

A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.

3.7 REPAIRS

A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.

B. Repair fire protection damaged by other work before concealing it with other construction.

C. Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 07 81 00

SECTION 07 81 23 - INTUMESCENT FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Intumescent fire-resistive coatings.
   2. Topcoat decorative finish.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review products, design ratings, restrained and unrestrained conditions, thicknesses, and other performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Intumescent fire-resistive coatings.
   2. Substrate primers.
   3. Topcoat.

B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
   1. Extent of fire protection for each construction and fire-resistance rating.
   2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
   3. Minimum intumescent fire-resistive coating thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
   4. Treatment of intumescent fire-resistive coating after application.

C. Samples: For each exposed product and for each color and texture specified, 6 inches square in size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of intumescent fire-resistive coating.

C. Evaluation Reports: For intumescent fire-resistive coating, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by intumescent fire-resistive coating manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Build mockup of each type of fire protection and different substrate and each required finish as shown on Drawings.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Unacceptable mockups shall be completely removed and reapplied for review. Repair or patch work will not be allowed.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 50 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.

B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fire protection dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Source Limitations: Obtain fire protection from single source.

C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Steel members are to be considered unrestrained unless specifically noted otherwise.

D. Asbestos: Provide products containing no detectable asbestos.

2.2 INTUMESCENT FIRE-RESISTIVE COATINGS

A. Intumescent Fire-Resistive Coating: Manufacturer's standard, factory-mixed formulation or factory-mixed, multicomponent system consisting of intumescent base coat and topcoat, and complying with indicated fire-resistance design.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Carboline Company; a subsidiary of RPM International.
b. Hilti, Inc.
c. Isolatek International.
d. Sherwin-Williams Company (The).

2. Application: Designated for "interior general purpose" use by a qualified testing agency acceptable to authorities having jurisdiction.
3. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
4. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.
5. Finish: Smooth-textured finish.
   a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.3 AUXILIARY MATERIALS

A. Provide auxiliary materials that are compatible with intumescent fire-resistive coating and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by intumescent fire-resistive coating manufacturer and complying with required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

C. Topcoat: Suitable for application over intumescent fire-resistive coating; of type recommended in writing by intumescent fire-resistive coating manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
   1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.
   2. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
   3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.

B. Conduct tests according to intumescent fire-resistive coating manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.

B. Clean substrates of substances that could impair bond of fire protection.

C. Prime substrates where included in fire-resistance design and where recommended in writing by intumescent fire-resistive coating manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fire protection. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

A. Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fire protection Work.

B. Comply with intumescent fire-resistive coating manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
   1. Do not begin applying fire protection until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
   2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.

D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and intumescent fire-resistive coating manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and

anchorage devices of type recommended in writing by intumescent fire-resistive coating manufacturer.

E. Spray apply fire protection to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by intumescent fire-resistive coating manufacturer.

F. Extend fire protection in full thickness over entire area of each substrate to be protected.

G. Install body of fire protection in a single course unless otherwise recommended in writing by intumescent fire-resistive coating manufacturer.

H. Provide a uniform finish complying with description indicated for each type of fire protection material and matching finish approved for required mockups.

I. Cure fire protection according to intumescent fire-resistive coating manufacturer's written instructions.

J. Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.

K. Finishes: Where indicated, apply fire protection to produce the following finishes:
   1. Smooth Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness and provide a smooth finish.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Test and inspect as required by the IBC, Subsection 1705.14, "Mastic and Intumescent Fire-Resistant Coatings."

B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fire protection for the next area until test results for previously completed applications of fire protection show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.

C. Fire protection will be considered defective if it does not pass tests and inspections.
   1. Remove and replace fire protection that does not pass tests and inspections, and retest.
   2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

3.6 PROTECTION

A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.

3.7 REPAIRS

A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.

B. Repair fire protection damaged by other work before concealing it with other construction.

C. Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 07 81 23

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Penetration firestopping systems.
   2. Penetrations in fire-resistance-rated walls.
   3. Penetrations in horizontal assemblies.
   4. Penetrations in smoke barriers.
   5. Exposed penetration firestopping systems.

B. Single Source Responsibility: All penetration firestopping shall be provided by a single contractor.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Unlisted Firestopping Systems: Obtain an Engineering Judgment (EJ) from firestopping manufacturer where no UL, FM Approvals, or other listed assembly is available for particular firestop configuration. Follow International Firestop Council (IFC) recommended guidelines for evaluating firestopping systems in EJs.

C. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
   1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Entity that has been approved by FM Approvals in accordance with FM Approvals 4991 or been evaluated by UL and found to comply with UL's "UL Solutions Qualified Firestop Contractor Program."

1.7 MOCKUPS

A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockup of each penetration firestopping system type required for Project, including supporting construction substrates, attachments, and accessories.
   2. Where one penetration firestopping system type may be used for different penetrating items or in different wall or floor constructions, install one assembly for each different combination.
   3. Obtain approval of mockups from authorities having jurisdiction before proceeding.
   4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
   5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping systems when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping system materials in accordance with manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be accessed and installed in accordance with specified firestopping system design.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain penetration firestopping systems for each type of opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:
   1. A qualified testing agency, acceptable to authorities having jurisdiction, will perform penetration firestopping system tests.
   2. Test in accordance with testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
      a. Penetration firestopping systems installed with products bearing the classification marking of a qualified testing agency.
         1) UL in its online directory "Product iQ."
         2) Intertek Group in its "Directory of Building Products."

B. Provide components for each penetration firestopping system that, upon curing, do not re-emulsify, dissolve, leach, break down, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water, or other forms of moisture characteristic during and after construction.

C. Provide components for each penetration firestopping system that do not contain ethylene glycol.

D. Provide components for each penetration firestopping system that are sufficiently flexible to accommodate movement, such as pipe vibration, water hammer, thermal expansion, and other normal building movement without damage.

E. Provide components for each penetration firestopping system that are appropriately tested for the thickness and type of insulation utilized.

2.3 PENETRATION FIRESTOPPING SYSTEMS

A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems must be compatible with one another, with the substrates forming openings, and with penetrating items if any.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
      a. 3M Fire Protection Products.
      b. Hilti, Inc.
      c. RectorSeal Firestop Solutions.

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.
   1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
   2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.

C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined in accordance with ASTM E814 or UL 1479.
   1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
   2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
      a. Those within the cavity of a wall.
      b. Floor, tub, or shower drains within a concealed space.
      c. 4-inch or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.

D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined in accordance with UL 1479.
   1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.

E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested in accordance with ASTM E84 or UL 723.

2.4 ACCESSORIES

A. Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated, including but not limited to:
   1. Permanent forming/damming/backing materials.
   2. Substrate primers.
   3. Collars.
   4. Steel sleeves.

2.5 FILL MATERIALS

A. Cast-in-Place Firestopping Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestopping Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, and when required by a listed system, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed or dislodged.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

K. Thermal and Endothermic Wraps: Flexible, insulating, and fire-resistant protective wraps tested and listed for up to 2-hour fire ratings in accordance with ASTM E814 or UL 1479; for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines, and for thermal barrier and circuit integrity protection in accordance with ASTM E1725 or UL 1724.

L. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls which accept standard accessories.

M. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
   1. Fire-rated cable pathway devices are the preferred product for data, video, and communications cable penetrations. Install these devices in locations where frequent cable moves, add-ons, and changes will occur. Such devices must be:
      a. Capable of retrofit around existing cables.
      b. Designed so that two or more devices can be ganged together.
      c. Maintenance-free so no action is required to activate the smoke- and fire-sealing mechanism.

2. Where fire-rated cable pathway devices are not practical, openings within walls and floors designed to accommodate data, video, and communications cabling must be provided with re-enterable products specifically designed for retrofit, such as retrofit devices for cable bundles, firestopping putty, plugs, or pillows.

N. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for firestopping existing over-filled cable sleeves and capable of being installed around projecting sleeves and cable bundles.

O. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.

P. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestopping gasket for use around rectangular steel HVAC ducts without fire dampers.

Q. Firestopping Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.

R. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to 1/2 inch in diameter.

S. Closet Flange Gasket: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.

2.6 MIXING

A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings in accordance with manufacturer's written instructions and with the following requirements:
   1. Remove foreign materials from substrate surfaces that could interfere with adhesion of penetration firestopping materials.
   2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Prime substrates in accordance with penetration firestopping system manufacturer's written installation instructions, using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

A. General: Install penetration firestopping systems in accordance with manufacturer's written installation instructions and published drawings for products and applications.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

C. Install fill materials by proven techniques to produce the following results:
   1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve required fire-resistance ratings.
   2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
   3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
   1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. from end of wall and at intervals not exceeding 30 ft..

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing and inspecting agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified inspection agency to conduct and report on inspections in accordance with ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 84 43 - JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Perimeter fire-barrier system.
   2. Joints in or between fire-resistance-rated construction.
   3. Joints at exterior curtain-wall/floor intersections.
   4. Joints in smoke barriers.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.

B. Unlisted Firestopping Systems: Obtain an Engineering Judgment (EJ) from firestop manufacturer where no UL, FM Approvals, or other listed assembly is available for particular firestop configuration. Follow International Firestop Council (IFC) recommended guidelines for evaluating firestop systems in EJs.

C. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
   1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an EJ or equivalent fire-resistance-rated assembly developed in accordance with current IFC guidelines.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written installation instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Approvals in accordance with FM Approvals 4991 or been evaluated by UL and found to comply with UL's "UL Solutions Qualified Firestop Contractor Program."

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Install and cure joint firestopping systems in accordance with manufacturer's written installation instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of joints to ensure that joint firestopping systems can be installed in accordance with specified firestopping system design.

B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:
   1. A qualified testing agency, acceptable to authorities having jurisdiction, will perform joint firestopping system tests.
   2. Test in accordance with testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
      a. Joint firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
         1) UL in its online directory "Product iQ."
         2) Intertek Group in its "Directory of Building Products."

B. Rain/Water Resistance: For perimeter fire-barrier system applications, where inclement weather or greater-than-transient water exposure is expected, use products that dry rapidly and cure in the presence of atmospheric moisture sufficient to pass ASTM D6904 early rain-resistance test (24-hour exposure).

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 3M Fire Protection Products.
   2. Hilti, Inc.
   3. RectorSeal Firestop Solutions.

2.4 JOINT FIRESTOPPING SYSTEM TYPES

A. General: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems must accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
   1. Joint firestopping systems that are compatible with one another, with the substrates forming openings, and with penetrating items, if any.
   2. Provide products that, upon curing, do not re-emulsify, dissolve, leach, break down, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture.
   3. Provide firestop products that do not contain ethylene glycol.

B. Perimeter Fire-Barrier System: Provide perimeter fire-barrier system that does not require direct screw attachment to mullions and transoms to support and fasten curtain-wall insulation for aluminum curtain-wall assemblies with one- or two-piece rectangular mullions at least 2-1/2 by 5 inches. System will be tested in accordance with ASTM E2307 for up to two-hour fire resistance and with ASTM E1233/E1233M for wind cycling equivalent to 108 mph wind for 500 cycles.

C. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined in accordance with ASTM E1966 or UL 2079, with published L-Ratings for ambient and elevated temperatures as evidence of the ability of the fire-resistive joint system to restrict the movement of smoke.
   1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

D. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined in accordance with ASTM E2307.
   1. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.

E. Joints in Smoke Barriers: Provide joint firestopping systems with ratings determined in accordance with UL 2079 based on testing at a positive pressure differential of 0.30 inch wg.
   1. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.

F. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined in accordance with ASTM E84.

2.5 ACCESSORIES

A. Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing joint firestopping systems, clean joints in accordance with fire-resistive joint system manufacturer's written installation instructions and the following requirements:
   1. Remove foreign materials from substrate surfaces that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
   2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form-release agents from concrete.

B. Prime substrates in accordance with joint firestopping system manufacturer's written installation instructions, using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Apply a suitable bond breaker to prevent three-sided adhesion in applications where condition occurs.

3.3 INSTALLATION

A. General: Install joint firestopping systems in accordance with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
   1. Apply elastomeric fill in voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
   2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
   3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Wall Identification: Permanently label walls containing firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
   1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. from end of wall and at intervals not exceeding 30 ft..

B. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge, so labels are visible to anyone seeking to remove joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections in accordance with ASTM E2393.

B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's online directory "Product iQ" under product Category XHBN or Category XHDG.

B. Where Intertek Group-listed systems are indicated, they refer to design numbers in Intertek Group's "Directory of Building Products" under product category Firestop Systems.

C. Head-of-Wall, Fire-Resistive Joint Firestopping Systems:.
   1. UL-Classified Systems: HW-D - 0000-0999.
   2. Assembly Rating: Two hours.
   3. Nominal Joint Width: As indicated.

D. Perimeter Joint Firestopping Systems:.
   1. UL-Classified Perimeter Fire-Containment Systems: CW-D - 0000-0999.
   2. Integrity Rating: Two hours.
   3. Linear Opening Width: As indicated, maximum.

END OF SECTION 07 84 43

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Nonstaining silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:
1. Joint-sealants.
2. Joint sealant backing materials.

B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:
1. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
a. Joint-sealant location and designation.
b. Manufacturer and product name.
c. Type of substrate material.
d. Proposed test.
e. Number of samples required.

B. Field Quality-Control Submittals:
1. Field-Adhesion-Test Reports: For each sealant application tested.

C. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Warranty Documentation:
1. Manufacturers' special warranties.

2. Installer's special warranties.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Installers: Authorized representative who is trained and approved by manufacturer.
   2. Testing Agency: Qualified in accordance with ASTM C1021 to conduct the testing indicated.

1.6 MOCKUPS

A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
   1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.

B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
   1. Products: Subject to compliance with requirements, provide the following:
      a. DOWSIL 790; DOW.

C. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
   1. Products: Subject to compliance with requirements, provide the following:
      a. DOWSIL 756 SMS; DOW.

2.4 URETHANE JOINT SEALANTS

A. Urethane, M, NS, 25, T, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 25, Uses T and NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Master Builders Solutions; MasterSeal NP 2 (Pre-2014: Sonolastic NP2).
      b. Sika Corporation; Joint Sealants; Sikaflex 2c NS EZ Mix.

2.5 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
   1. Products: Subject to compliance with requirements, provide the following:
      a. DOWSIL 790 Silicone Building Sealant; DOW.

2.6 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
   1. Products: Subject to compliance with requirements, provide the following:
      a. BASF Building Systems; Sonolac.
      b. Bostik, Inc.; Chem-Calk 600.
      c. Tremco Incorporated; Tremflex 834.

2.7 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.8 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
   2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
      a. Concrete.
      b. Masonry.
      c. Unglazed surfaces of ceramic tile.
      d. Exterior insulation and finish systems.
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
      a. Metal.
      b. Glass.
      c. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.
   4. Provide flush joint profile at locations indicated on Drawings in accordance with Figure 8B in ASTM C1193.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:
   1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
      a. Extent of Testing: Test completed and cured sealant joints as follows:
         1) Perform 10 tests for the first 1000 ft. of joint length for each kind of sealant and joint substrate.

2) Perform one test for each 1000 ft. of joint length thereafter or one test per each floor per elevation.

b. Test Method: Test joint sealants in accordance with Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
   1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

c. Inspect tested joints and report on the following:
   1) Whether sealants filled joint cavities and are free of voids.
   2) Whether sealant dimensions and configurations comply with specified requirements.
   3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

C. Prepare test and inspection reports.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Exterior joints in horizontal traffic surfaces:
   1. Joint Locations:
      a. Isolation and contraction joints in cast-in-place concrete slabs.
      b. Joints between plant-precast architectural concrete paving units.
      c. Joints in stone paving units, including steps.
      d. Joints between different materials listed above.
      e. Other joints as indicated on Drawings.
   2. Joint Sealant: Urethane, M, NS, 25, T.

B. Exterior joints in vertical surfaces and horizontal nontraffic surfaces:
   1. Joint Locations:
      a. Construction joints in cast-in-place concrete.
      b. Joints between plant-precast architectural concrete units.
      c. Control and expansion joints in unit masonry.
      d. Joints in dimension stone cladding.
      e. Joints in exterior insulation and finish systems.
      f. Joints between different materials listed above.
      g. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
      h. Control and expansion joints in ceilings.
      i. Other joints as indicated on Drawings.
   2. Joint Sealant: Silicone, nonstaining, S, NS, 100/50, NT.

C. Exterior joints in vertical surfaces and horizontal nontraffic surfaces:
   1. Joint Locations:
      a. Joints between metal panels.
      b. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
      c. Other joints as indicated on Drawings.
   2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.

D. Interior joints in horizontal traffic surfaces:
   1. Joint Locations:
      a. Isolation joints in cast-in-place concrete slabs.
      b. Control and expansion joints in stone flooring.
      c. Control and expansion joints in tile flooring.
      d. Other joints as indicated on Drawings.
   2. Joint Sealant: Urethane, M, NS, 25, T, NT.

E. Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement:
   1. Joint Locations:
      a. Control joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
      c. Other joints as indicated on Drawings.

2. Joint Sealant: Acrylic latex.

F. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces :
   1. Joint Locations:
      a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
      b. Tile control and expansion joints where indicated.
      c. Other joints as indicated on Drawings.
   2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.

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SECTION 07 92 19 - ACOUSTICAL JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Acoustical joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants, showing full range of available colors for each product exposed to view.

C. Acoustical Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
   3. Joint-sealant formulation.
   4. Joint-sealant color.

1.3 CLOSEOUT SUBMITTALS

A. Warranty Documentation:
   1. Manufacturers' special warranties.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained between 40 and 95 deg F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 35 and 100 deg F.

PART 2 - PRODUCTS

2.1 ACOUSTICAL JOINT SEALANTS

A. Acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies in accordance with ASTM E90.

B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C834.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. GE Construction Sealants; Momentive Performance Materials Inc.; RCS20 Acoustical.
      b. Grabber Construction Products; Acoustical Sealant GSC.
      c. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant.

C. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.

2.2 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by acoustical joint-sealant manufacturer where required for adhesion of sealant to joint substrates.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where recommended by acoustical joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.

B. Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C919, ASTM C1193, and manufacturer's written instructions for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of acoustical joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect acoustical joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

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SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Interior custom hollow-metal doors and frames.
   2. Exterior custom hollow-metal doors and frames.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:
   1. Elevations of each door type.
   2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of each different wall opening condition.
   6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
   7. Details of anchorages, joints, field splices, and connections.
   8. Details of accessories.
   9. Details of moldings, removable stops, and glazing.

C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.
   1. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

B. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly, fire-rated borrowed-lite assembly, and thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

C. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.

D. Field quality control reports.

1.6 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.7 QUALITY ASSURANCE

A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
   1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

B. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies shall meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
   1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
   1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Ceco Door Products, / an ASSA ABLOY Group company.
   2. de La Fontaine Industries.
   3. Deansteel Manufacturing.
   4. Steelcraft an Allegion Brand.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
   1. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.
   2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
   3. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

B. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing in accordance with NFPA 257 or UL 9.

C. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.77 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C518.

2.3 INTERIOR CUSTOM HOLLOW-METAL DOORS AND FRAMES

A. Commercial Doors and Frames: NAAMM-HMMA 861; ANSI/SDI A250.4, Physical Performance Level A..
   1. Doors:
      a. Type: As indicated in the Door and Frame Schedule.
      b. Thickness: 1-3/4 inches.
      c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch.
      d. Edge Construction: Continuously welded with no visible seam.

e. Core: Steel stiffened.
f. Fire-Rated Core: Manufacturer's standard laminated mineral board core for fire-rated and temperature-rise-rated doors.

2. Frames:
a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch, except 0.067 inch for openings exceeding 4 feet wide.
b. Sidelite Frames: Fabricated from same material as adjacent door frame.
c. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.4 EXTERIOR CUSTOM HOLLOW-METAL DOORS AND FRAMES

A. Commercial Laminated Doors and Frames: NAAMM-HMMA 867; ANSI/SDI A250.4, Physical Performance Level A..

1. Doors:
a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches.
c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum G60 coating.
d. Edge Construction: Continuously welded with no visible seam.
e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
f. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
g. Core: Polyisocyanurate.

2. Frames:
a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum G60 coating.
b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.5 BORROWED LITES

A. Fabricate of uncoated steel sheet, minimum thickness of 0.053 inch.

B. Construction: Full profile welded.

C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.

D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.6 HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.7 FRAME ANCHORS

A. Jamb Anchors:
1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.8 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread

and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

2.9 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
   1. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
   2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
   3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
      a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
      b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule, and templates.
   1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
   2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

D. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted hairline joints.
   1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
   2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
   3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
   4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.10 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.11 LOUVERS

A. Provide louvers for interior doors, where indicated, which comply with SDI 111, with blades or baffles formed of 0.020-inch- thick, cold-rolled steel sheet set into 0.032-inch-thick steel frame.
1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
2. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.

B. Form corners of moldings with hairline joints. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with NAAMM-HMMA 840.
   1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
      a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
      b. Install frames with removable stops located on secure side of opening.
   2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
   3. Floor Anchors: Secure with postinstalled expansion anchors.
   4. Solidly pack mineral-fiber insulation inside frames.
   5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
   6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
   7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
      a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
      c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
   1. Non-Fire-Rated Steel Doors: Comply with NAAMM-HMMA 841 and NAAMM-HMMA guide specification indicated.
   2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.
   3. Smoke-Control Doors: Install doors in accordance with NFPA 105.

D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:
   1. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
   2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

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SECTION 08 11 16.13 - INTERIOR ALUMINUM DOOR FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior aluminum door frames.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.
      a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:
   1. Elevations, sections, and installation details for each wall-opening condition.
   2. Details of construction of each component, including dimensioned profiles and metal thicknesses.
   3. Locations of reinforcements and preparations for hardware.
   4. Details of anchorages, joints, splices, connections, and accessories.
   5. Details of trim, removable stops, and glazing.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Product Schedule: Use same designations indicated on Drawings. Coordinate with door hardware schedule and glazing.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For interior aluminum doors and frames.

PART 2 - PRODUCTS

2.1 INTERIOR ALUMINUM DOOR FRAMES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Avalon International Aluminum.
   2. Frameworks Manufacturing.
   3. Special-Lite.

B. Source Limitations: Obtain interior aluminum doors and frames from single source from single manufacturer.

C. Aluminum Framing: ASTM B221, with alloy and temper required to suit structural and finish requirements, and not less than 0.062 inch thick.

D. Door Frames: Extruded aluminum, reinforced for hinges, strikes, and closers.

E. Glazing Frames: Extruded aluminum, for glass thickness indicated on Drawings.

F. Trim: Extruded aluminum, not less than 0.062 inch thick; removable, snap-in glazing stops, without exposed fasteners.

2.2 ACCESSORIES

A. Wood Doors: As specified in Section 08 14 16 "Flush Wood Doors."

B. Fasteners: Aluminum, nonmagnetic, stainless steel, zinc-plated steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.

C. Corner Reinforcements and Alignment Clips: Manufacturer's standard concealed units to provide accurately fitted hairline joints at butted and mitered connections.

D. Door Silencers: Manufacturer's standard continuous mohair, wool pile, or vinyl seals, black.

E. Glazing Gaskets: Manufacturer's standard extruded or molded rubber or plastic, to accommodate glazing thickness indicated; black.

F. Glazing Stops: Removable to allow glazing replacement without framing disassembly.

G. Glass: As specified in Section 08 80 00 "Glazing."

H. Door Hardware: As specified in Section 08 71 00 "Door Hardware."

2.3 FABRICATION

A. Hardware Preparation: Factory prepare components to receive templated mortised hardware; include cutouts, reinforcements, mortising, drilling, and tapping.
   1. Reinforce doors and frames to receive nontemplated mortised and surface-mounted hardware.

B. Glazing Stops: Locate removable stops on inside of spaces accessed by locking doors.

C. Fabricate components to allow secure installation without exposed fasteners and to provide accurately fitted hairline joints at butted and mitered connections.

2.4 ALUMINUM FINISHES

A. Comply with NAAMM/NOMMA AMP 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
   1. Color: Dark bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM DOOR FRAMES

A. Install aluminum frames plumb, rigid, properly aligned, and securely fastened in place in accordance with manufacturer's written instructions.
   1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
   2. Secure clips to extruded main-frame components and not to snap-in or trim members.
   3. Do not leave screws or other fasteners exposed to view when installation is complete.

B. Glass: Install glass in accordance with Section 08 80 00 "Glazing" and aluminum-frame manufacturer's written instructions.

C. Doors: Install doors aligned with frames and fitted with required hardware.
   1. Wood Doors: Install in accordance with Section 08 14 16 "Wood Doors" and aluminum-frame manufacturer's written instructions.
   2. Hardware: Install in accordance with Section 08 71 00 "Door Hardware" and aluminum-frame manufacturer's written instructions.

3.3 ADJUSTING AND CLEANING

A. Inspect installation, correct misalignments, and tighten loose connections.

B. Doors: Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly in accordance with manufacturer's written instructions.

C. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended in writing by frame manufacturer and in accordance with AAMA 609 & 610.

D. Touch Up: Immediately after installation, repair damaged areas of aluminum finishes and touchup in accordance with manufacturer's written instructions.

END OF SECTION 08 11 16.13

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Solid-core five-ply flush wood veneer-faced doors panels for transparent finish.
2. Sound Transmission Class (STC) rated doors.
3. Light frames and louvers.

1.2 ACTION SUBMITTALS

A. Product Data:
1. Solid-core five-ply flush wood veneer-faced doors and transom panels for transparent finish.
2. Light frames and louvers.

B. Product Data Submittals: For each product, including the following:
1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door louvers.
5. Door trim for openings.
6. Factory-machining criteria.
7. Factory- finishing specifications.
8. Sound ratings.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Dimensions and locations of mortises and holes for hardware.
7. Clearances and undercuts.
8. Requirements for veneer matching.
9. Doors to be factory finished and application requirements.

D. Samples for Initial Selection: For factory-finished doors .

E. Samples for Verification:
1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent

finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
3. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.3 INFORMATIONAL SUBMITTALS

A. Test Reports: Submit manufacturer’s test results of STC ratings from testing performed by independent testing agency for sound-retardant doors.

B. Qualification Data: For door inspector.
1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.

C. Field quality-control reports.

D. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Special warranties.

B. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.5 QUALITY ASSURANCE

A. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies complies with qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.

B. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies complies with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations:
1. Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Delamination of veneer.
b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
2. Warranty also includes installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain flush wood doors from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Wood Door and Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.
1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

B. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.

C. Sound Rating: Provide sound rated (STC) door assemblies identical to those of assemblies tested as sound-retardant units by an acoustical testing agency, and have the following minimum rating:
   1. STC Rating: 50 as calculated by ASTM E413 when tested in an operable condition in accordance with ASTM E90.

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Lambton Doors.
   2. Forte Opening Solutions.
   3. Oshkosh Door Co.
   4. VT Industries.

2.4 FLUSH WOOD DOORS AND FRAMES, GENERAL

A. Quality Standard: In addition to requirements specified, comply with ANSI/WDMA I.S. 1A.
   1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

2.5 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS AND TRANSOM PANELS FOR TRANSPARENT FINISH

A. Product/Manufacturer: Basis of design.
   1. Heritage Collection; VT Industries.

B. Interior Doors, Solid-Core Five-Ply Veneer-Faced:
   1. Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty.
   2. ANSI/WDMA I.S. 1A Quality Grade: Custom.
   3. Faces: Single-ply wood veneer not less than 1/50 inch thick.
      a. Species: White oak.
      b. Cut: Rift cut.
      c. Match between Veneer Leaves: Slip match.
      d. Assembly of Veneer Leaves on Door Faces: Running match.
      e. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
      f. Room Match:
         1) Provide door faces of compatible color and grain within each separate room or area of building.
   4. Exposed Vertical and Top Edges: Applied wood-veneer edges of same species as faces and covering edges of faces - Architectural Woodwork Standards edge Type B.

a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
b. Fire-Rated Pairs of Doors:
    1) Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
c. Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
    1) Screw-Holding Capability: 550 lbf in accordance with WDMA T.M. 10.

5. Core for Non-Fire-Rated Doors:
    a. ANSI A208.1, Grade LD-2 particleboard.
        1) Blocking: Provide wood blocking in particleboard-core doors as follows:
            a) 5-inch top-rail blocking, in doors indicated to have closers.
            b) 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
            c) 5-inch midrail blocking, in doors indicated to have exit devices.
6. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.
    a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as follows:
        1) 5-inch top-rail blocking.
        2) 5-inch bottom-rail blocking, in doors indicated to have protection plates.
        3) 5-inch midrail blocking, in doors indicated to have armor plates.
        4) 5-inch midrail blocking, in doors indicated to have exit devices.
7. Core for Sound-Rated (STC) Doors:
    a. Composite sound core containing lead to achieve STC rating.
        1) Blocking: Provide wood blocking in sound-core doors as follows:
            a) 5-inchtop-rail blocking, in doors indicated to have closers.
            b) 5-inchbottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
            c) 5-inchmidrail blocking, in doors indicated to have exit devices.
8. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

2.6 LIGHT FRAMES AND LOUVERS

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
    1. Wood Species: Same species as door faces.
    2. Profile: Manufacturer's standard shape.
    3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated on Drawings.

C. Metal Louvers:
   1. Blade Type: Vision-proof, inverted V.
   2. Metal and Finish:
      a. Hot-dip galvanized steel, 0.040 inch thick, with baked-enamel- or powder-coated finish.

D. Louvers for Fire-Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire-protection rating of 1-1/2 hours and less.
   1. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, with baked-enamel- or powder-coated finish.

2.7 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.
   1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
   2. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied.
   1. Locate hardware to comply with DHI-WDHS-3.
   2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
   3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
   4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

C. Transom and Side Panels:
   1. Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors.
   2. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
   3. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.

D. Openings: Factory cut and trim openings through doors.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."
   3. Louvers: Factory install louvers in prepared openings.

2.8 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.
   1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   2. Finish faces, all four edges, edges of cutouts, and mortises.
   3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:
   1. ANSI/WDMA I.S. 1A Grade: Custom.
      a. TR-6 Catalyzed Polyurethane.
   2. Staining: Match Architect's sample.
   3. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.
   1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
   2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 08 71 00 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:
   1. Provide inspection of installed Work through WI's Certified Compliance Program, certifying that wood doors and frames, including installation, comply with requirements of AWI/AWMCA/WI's "Architectural Woodwork Standards" for the specified grade.
   2. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
   3. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.

3.4 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

SECTION 08 14 33 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior stile and rail wood doors.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. Interior stile and rail wood doors.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:
   1. Door schedule indicating door location, type, size, fire protection rating, and swing.
   2. Door elevations, dimensions and location of hardware, lite locations, and glazing thickness.
   3. Details of frame for each frame type, including dimensions and profile.
   4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
   5. Dimensions and locations of mortises and holes for hardware.
   6. Clearances and undercuts.
   7. Requirements for veneer matching.
   8. Doors to be factory finished and application requirements.

C. Samples for Initial Selection: For factory-finished doors.

D. Samples for Verification:
   1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
   2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.
   1. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.

B. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS.

A. Special warranties.

1.5 QUALITY ASSURANCE

A. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies must meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
   1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in opaque plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations:
   1. Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity levels designed for building occupants for the remainder of construction period.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Delamination of veneer.
      b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
      c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
   2. Warranty must also include installation and finishing that may be required due to repair or replacement of defective doors.
   3. Warranty must be in effect during specified period of time from date of Substantial Completion.
   4. Warranty Period for Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain stile and rail wood doors from single manufacturer.

2.2 MATERIALS

A. Use only materials that comply with referenced standards and other requirements specified.
   1. Assemble interior doors, including components, with wet-use adhesives complying with ASTM D5572 for finger joints and with ASTM D5751 for joints other than finger joints.

B. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless those of Category I are expressly indicated and permitted.

2.3 INTERIOR STILE AND RAIL WOOD DOORS

A. Interior Stile and Rail Wood Doors: Interior custom doors complying with WDMA I.S. 6A and with other requirements specified.
   1. Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty.
   2. ANSI/WDMA I.S. 1A Quality Grade: Custom.
   3. Finish: Transparent.
   4. Wood Species and Cut for Transparent Finish: White oak, rift sawed/sliced stiles and rails.
   5. Door Construction for Transparent Finish:
      a. Stile and Rail Construction:
         1) Clear lumber; may be edge glued for width. Select lumber for similarity of grain and color, and arrange for optimum match between adjacent pieces.
   6. Stile and Rail Widths: As indicated.
   7. Molding Profile (Sticking): As selected by Architect from manufacturer's full range.
   8. Glass: Uncoated, clear, fully tempered float glass, 5.0 mm thick, complying with Section 08 80 00 "Glazing."
   9. Mark, label, or otherwise identify stile and rail wood doors as complying with WDMA I.S. 6A and grade specified.

2.4 STILE AND RAIL WOOD DOOR FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:
   1. Clearances:
      a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
      b. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering.

c. Where threshold is shown on Drawings or scheduled, provide not more than 3/8 inch from bottom of door to top of threshold.
d. Comply with NFPA 80 requirements for fire-rated doors.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

B. Factory machine doors for hardware that is not surface applied.
1. Locate hardware to comply with DHI-WDHS-3.
2. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
3. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
4. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Glazed Openings:
1. Trim openings indicated for glazing with solid-wood moldings, with one side removable. Miter wood moldings at corner joints.
2. Factory install glazing in doors, complying with Section 08 80 00 "Glazing." Install glass using manufacturer's standard elastomeric glazing sealant complying with ASTM C920. Secure glass in place with removable wood moldings. Miter wood moldings at corner joints.

2.5 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.
1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
2. Finish faces, all four edges, edges of cutouts, and mortises.
3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:
1. WDMA I.S. 6A Grade: Custom.
a. TR-6 Catalyzed Polyurethane.
2. Staining: Match Architect's sample.
3. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.
1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 08 71 00 "Door Hardware."

B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory- Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Owner will engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:
1. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door installations comply with specified requirements.

3.4 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 33

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SECTION 08 16 16 - FIBERGLASS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fiberglass reinforced polyester (FRP) flush doors with FRP frames.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.

B. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, and finish.

C. Samples:
   1. Door: Submit manufacturer's sample of door showing face sheets, core, framing, and finish.
   2. Color: Submit manufacturer's samples of standard colors of doors and frames.

D. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.

E. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.

F. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.

G. Warranty: Submit manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 25 years successful experience.
   2. Door and frame components from same manufacturer.
   3. Evidence of a compliant documented quality management system.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.

C. Handling: Protect materials and finish from damage during handling and installation.

1.5 WARRANTY

A. Warrant doors, frames, and factory hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.

B. Warranty Period: Ten years starting on date of shipment. In addition, a limited lifetime (while the door is in its specified application in its original installation) warranty covering: failure due to corrosion

PART 2 - .PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Provide door assemblies that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.

B. Thermal Performance: Per ASTM C 1363-97, R-value 7.42.

C. Air Infiltration: For a single door 3 by 7 feet, test specimen shall be tested in accordance with ASTM E 283 at pressure differential of 6.24 psf. Door shall not exceed 0.09 cfm/ft2.

D. Water Penetration: For a single door 3 by 7 feet, test specimen shall be tested in accordance with ASTM E 331. Door shall not have water leakage.

E. Uniform Load Structural: For a single door 3 by 7 feet, test specimen shall be tested in accordance with ASTM E 330: Plus or minus 270 psf.

F. Forced Entry Resistance, per AAMA 1304, Pass with No Entry.

G. Air Pressure Cycling, Doors and Frames, ASTM E 1886, Design Pressure Plus or Minus 100 psf, Pass with no rips, tears, or penetrations.

H. Cycle Test, AAMA 920-11, 2,000,000 Cycles.

I. Screw Pullout, ASTM D 1761-06, Minimum 924 pounds.

2.2 FRP FLUSH DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Special-Lite, Inc.

2. Corrim Company.
3. Weiland, Inc.

B. Product/Manufacturer: Basis of design.
1. Model: AF-200 Smooth Composite Fiberglass Door; Special-Lite.

C. Construction:
1. Door Thickness: 1-3/4 inches.
2. Stiles & Rails.
a. Pultruded fiberglass with integral channels for securing corner reinforcing clip.
3. Corners.
a. Mitered.
b. Secured with pultruded fiberglass corner clip chemically welded to stiles and rails.
c. Mechanical fasteners to secure corner joints not acceptable.

D. Face Sheet:
1. Interior and Exterior
a. 0.090” thick, Class C, smooth texture, painted FRP sheet

E. Texture: Smooth.
1. Fiberglass Content: Minimum 47% by weight.
2. Color: As selected by Architect from manufacturer's full range.

F. Core:
1. Material: Polyurethane foam.
2. Density: Minimum of 5 pounds per cubic foot.
3. Per ASTM E 84 flame spread and smoke developed: Class B.

G. Cutouts:
1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
2. Factory install vision lites, louvers, and panels.

H. Hardware:
1. Pre-machine doors in accordance with templates from specified hardware manufacturers and hardware schedule.

2.3 MATERIALS

A. Components: Door and frame components from same manufacturer.

B. Fasteners:
1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
2. Compatibility: Compatible with items to be fastened.

2.4 FABRICATION

A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on the Drawings.

B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.

C. Assembly:
1. Complete cutting, fitting, forming, drilling, and chemically welding of FRP before assembly.

D. Fit:
1. Maintain continuity of line and accurate relation of planes and angles.
2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

2.5 FRP FRAMING SYSTEMS

A. Product/Manufacturer: Basis of design.
1. AF-150 Frame; Special-Lite.
2. Size and Type: As indicated on the Drawings.
3. Materials: ¼-inch thick solid pultruded FRP profiles having no corrosive components or reinforcement.
4. Width: 2-inch face.
5. Depth: As indicated on Drawings.
6. Assembly: Knock down (KD) for field assembly.
7. Door Stop: 5/8 by 2-¼ inches.
8. Corner Construction: Mitered with 4 by 4 by 3/8 inches pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
9. Reinforcing: ¼-inch pultruded FRP chemically welded at all hinge, strike and closer locations.
10. Anchors: Furnished with type as for construction where frames are indicated.
11. Fasteners for reinforcing: 18-8 Stainless Steel.

2.6 HARDWARE

A. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.

B. Hardware Schedule: As specified in Section 08 71 00 and as follows.
1. Hinges: Select Products, Inc. Continuous Geared Hinge supplied by door manufacturer.

2.7 VISION LITES

A. Factory Applied Stop for Glazing:
1. Glass Type as indicated on Drawings and as specified in Section 08 80 00 – Glazing.

B. Lite Size:
   1. Size: As indicated on the Drawings.

2.8 FINISH

A. Finish for Doors and Frames: Primer with a finished color coat.
   1. Painted Finish: Two-part aliphatic polyurethane, low VOC, Industrial Coating.
   2. Thickness: 5 mils.
   3. Sheen: Gloss.
   4. Impact Resistance per ASTM D 2794: 140 in lbs.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.3 INSTALLATION

A. Install doors in accordance with manufacturer's instructions.

B. Install doors plumb, level, square, true to line, and without warp or rack.

C. Anchor frames securely in place.

D. Set thresholds in bed of mastic and backseal.

E. Install exterior doors to be weathertight in closed position.

F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

3.5 ADJUSTING

A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.6 CLEANING

A. Clean doors promptly after installation in accordance with manufacturer's instructions.

B. Do not use harsh cleaning materials or methods that would damage finish.

3.7 PROTECTION

A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION 08 16 16

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Access doors and frames.
   2. Fire-rated access doors and frames.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, fire ratings, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.

C. Product Schedule: For access doors and frames.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing and inspecting agency.
   1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
   2. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

1.4 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of applicable room name and number in which access door is located.

1.5 QUALITY ASSURANCE

A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies meets the qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
   1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Babcock-Davis.
   2. Milcor; Hart & Cooley, Inc.
   3. Nystrom, Inc.

2.3 ACCESS DOORS AND FRAMES

A. Flush Access Doors with Exposed Flanges:
   1. Description: Face of door flush with frame, with exposed flange and concealed hinge.
   2. Locations: Wall and ceiling.
   3. Stainless Steel Sheet for Door: Nominal 0.062 inch, 16 gage, ASTM A480/A480M No. 4 finish.
   4. Frame Material: Same material, thickness, and finish as door.
   5. Latch and Lock: Prepared for mortise cylinder.

2.4 FIRE-RATED ACCESS DOORS AND FRAMES

A. Fire-Rated, Flush Access Doors with Exposed Flanges:
   1. Description: Door face flush with frame, with a core of mineral-fiber insulation enclosed in sheet metal; with exposed flange, self-closing door, and concealed hinge.
   2. Locations: Wall and ceiling.
   3. Fire-Resistance Rating: Not less than that of adjacent construction.
   4. Temperature-Rise Rating: 250 deg F at the end of 30 minutes.
   5. Uncoated Steel Sheet for Door: Nominal 0.036 inch, 20 gage, factory primed.
   6. Stainless Steel Sheet for Door: Nominal 0.038 inch, 20 gage, ASTM A480/A480M No. 4 finish.
   7. Frame Material: Same material, thickness, and finish as door.
   8. Latch and Lock: Self-latching door hardware, prepared for mortise cylinder.

2.5 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.

C. Stainless Steel Plate, Sheet, and Strip: ASTM A240/A240M or ASTM A666, Type 316. Remove tool and die marks and stretch lines, or blend into finish.

D. Frame Anchors: Same material as door face.

E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.6 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

D. Latch and Lock Hardware:
1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
2. Keys: Furnish two keys per lock and key all locks alike.
3. Mortise Cylinder Preparation: Where indicated, prepare door panel to accept cylinder specified in Section 08 71 00 "Door Hardware."

2.7 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

E. Stainless Steel Finishes:
1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
2. Polished Finish: ASTM A480/A480M No. 4 finish. Grind and polish surfaces to produce uniform finish, free of cross scratches.
a. Run grain of directional finishes with long dimension of each piece.
b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:
   1. Fire-Rated Door Inspections: Inspect each fire-rated access door in accordance with NFPA 80, Section 5.2.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated access door indicating compliance with each item listed in NFPA 80.

3.4 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 08 31 13

SECTION 08 34 83 – FIRE AND SMOKE CONTAINMENT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Automatic Fire Curtains.
      a. Vertically deploying fire and smoke curtain recessed in ceiling.

1.2 REFERENCES

A. Underwriters Laboratories (UL):
   1. UL 10D - Standard for Fire Tests of Fire Protective Curtain Assemblies.

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Test reports.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods:
      a. Instructions for install and wiring.

B. Shop Drawings: Include system components and relevant options.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 years experience manufacturing similar equipment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products indoors in secure locker manufacturer's unopened packaging. Minimize movement until ready for installation. Delicate aluminum and electronic components can be damaged easily and should be handled with extreme care.

1.6 PROJECT CONDITIONS

A. Product intended for indoor use. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.7 WARRANTY

A. Manufacture's standard limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Colt International GmbH, distributed by Fire Curtain Technologies; Canandaigua, NY 14424; Tel: 585-412-2179; Email: info@firecurtaintech.com, www.firecurtaintechnologies.com

2.2 AUTOMATIC FIRE CURTAINS

A. Product/Manufacturer: Basis of Design.
   1. FA Automatic Fire Curtains by the Colt Group, and distributed by Fire Curtain Technologies.
   2. Electrically operated automatic fire curtain, seals off an area on fire, preventing fire from spreading. The curtain gravity falls in controlled manner to predetermined level when fire is detected or on loss of power. Curtain drops to floor from ceiling for fire containment.
   3. Performance Characteristics:
      a. Tested and in compliance with UL 10D for three hour rating.
      b. Successful continuous performance test of 10,000 cycles
   4. Dimensions and Size Range: Provide size suitable for project requirements; refer to the Drawings.
   5. Curtain Type:
      a. Single Unit (type SI).
   6. Bottom Bar Type: UK bottom bar (aluminum profile).
   7. Fire Rating:
      a. Fire Rating: 3 hours, UL 10D.
   8. Control Type: Control panel with integrated microprocessor designed to operate automatic smoke- or fire curtains in a safe and correct manner. The control panel shall be prepared for connection to a fire alarm system and designed to enable the implementation of additional operational functions.
      a. Power supply for 24V DC output for direct connection to the fire alarm system.
      b. Control panel can be wired to allow multiple curtains to operate as an integrated part of a smoke control and fire management system.
      c. In event of power failure, an uninterruptible power supply (UPS) may be supplied and connected so that the curtain remains retracted for a predetermined period (nominally 30 minutes). If signaled to descend during this time, the smoke curtain shall drop in a controlled manner to its fire operational position in a fail-safe manner.
      d. A key switch for manual operation can be connected to an uninterruptible power supply to maintain the curtains in their raised positions in the event of a main power outage.

B. Fabrication:
   1. Fabricate frames to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints. Assemble units in factory to minimize field splicing and assembly.

2. Disassemble units as necessary for shipping and handling limitations.
3. Clearly mark units for reassembly and coordinated installation.
4. Include anchors and accessories required for complete assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates and openings have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions. Test for proper operation.

3.4 PROTECTION

A. After installation, clean as recommended by the manufacturer.

B. Remove and legally dispose of construction debris from project site.

C. Protect installed products until completion of project.

D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 08 34 83

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SECTION 08 36 13 - SECTIONAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sectional-door assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.
   1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
   2. For power-operated doors, include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for components not dimensioned or detailed in manufacturer's product data.
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
   4. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For units with factory-applied finishes.
   1. Include Samples of accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For manufacturer's warranty and finish warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

B. Manufacturer's warranty.

C. Finish warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Failure of components or operators before reaching required number of operation cycles.
      c. Faulty operation of hardware.
      d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
      e. Delamination of exterior or interior facing materials.
   2. Warranty Period: Two years from date of Substantial Completion.

B. Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sectional doors from single source from single manufacturer.
   1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Provide sectional doors that comply with performance requirements specified without failure from defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
   1. Design Wind Load: As indicated on Drawings.
   2. Testing: In accordance with ASTM E330/E330M or DASMA 108 for garage doors and complying with DASMA 108 acceptance criteria.
   3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.
      a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of door width.

b. Deflection of horizontal track assembly shall not exceed 1/240 of door height.

2.3 SECTIONAL-DOOR ASSEMBLY

A. Steel Sectional Door: Provide sectional door formed with hinged sections and fabricated so that finished door assembly is rigid and aligned with tight hairline joints; free of warp, twist, and deformation; and complies with requirements in DASMA 102.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Haas Door.
b. Overhead Door Corporation.
c. Raynor Garage Doors.

B. Operation Cycles: Door components and operators capable of operating for not less than 50,000 operation cycles. One operation cycle is complete when door is opened from closed position to the open position and returned to closed position.

C. Air Infiltration: Maximum rate of 0.4 cfm/sq. ft. when tested in accordance with ASTM E283 or DASMA 105.

D. U-Value: 0.057 Btu/sq. ft. x h x deg F.

E. Steel Door Sections: ASTM A653/A653M, zinc-coated (galvanized), cold-rolled, commercial steel sheet with G90 zinc coating.
1. Door-Section Thickness: 2 inches.
2. Section Faces:
a. Thermal-Break Construction: Provide sections with continuous thermal-break construction separating the exterior and interior faces of door.
b. Exterior Face: Fabricated from single sheets, not more than 24 inches high; with horizontal meeting edges rolled to continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove, weather- and pinch-resistant seals and reinforcing flange return.
1) Steel Sheet Thickness: 0.028-inch nominal coated thickness.
2) Surface: Manufacturer's standard, flat.
c. Interior Face: Enclose insulation completely within steel exterior facing and interior facing material, with no exposed insulation. Provide the following interior-facing material:
1) Zinc-Coated (Galvanized) Steel Sheet: With minimum nominal coated thickness of 0.028 inch.
3. End Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.040-inch nominal coated thickness and welded to door section.
4. Section Reinforcing: Horizontal and diagonal reinforcement as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

a. Bottom Section: Reinforce section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal (weatherseal).
b. Hardware Locations: Provide reinforcement for hardware attachment.

5. Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free insulation of type indicated below:
   a. Foamed-in-Place Insulation: Polyurethane, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load.
   b. Fire-Resistance Characteristics: Maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, in accordance with ASTM E84.

F. Track: Manufacturer's standard, galvanized-steel, standard-lift track system. Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides.
   1. Material: Galvanized steel, ASTM A653/A653M, minimum G60 zinc coating.
   2. Size: 3 inches wide.
   3. Track Reinforcement and Supports: Provide galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches apart for door-drop safety device.
      a. Vertical Track: Incline vertical track to ensure weathertight closure at jambs. Provide intermittent jamb brackets attached to track and wall.
      b. Horizontal Track: Provide continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.

G. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom top and jambs of door. Provide combination bottom weatherseal and sensor edge for bottom seal.

H. Hardware: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless steel, or other corrosion-resistant fasteners, to suit door type.
   1. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch nominal coated thickness at each end stile and at each intermediate stile, in accordance with manufacturer's written recommendations for door size.
      a. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible.
      b. Provide double-end hinges where required for doors more than 16 ft. wide unless otherwise recommended by door manufacturer in writing.
   2. Rollers: Heavy-duty rollers with steel ball bearings in case-hardened steel races, mounted to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Match roller-tire diameter to track width.
      a. Roller-Tire Material: Case-hardened steel.
   3. Push/Pull Handles: Equip each door with galvanized-steel lifting handles on each side of door, finished to match door.

I. Locking Device:
   1. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded deadbolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
      a. Lock Cylinders: Cylinders complying with Section 08 71 00 "Door Hardware" requirements.
      b. Keying: Keyed to building keying system.
      c. Keys: Three for each cylinder.
   2. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

J. Counterbalance Mechanism:
   1. Torsion Spring: Adjustable-tension torsion springs complying with requirements of DASMA 102 for number of operation cycles indicated, mounted on torsion shaft.
   2. Cable Drums and Shaft for Doors: Cast-aluminum cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised.
      a. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.
      b. Provide one additional midpoint bracket for shafts up to 16 ft. long and two additional brackets at one-third points to support shafts more than 16 ft. long unless closer spacing is recommended in writing by door manufacturer.
   3. Cables: Galvanized-steel, multistrand, lifting cables with cable safety factor of at least 5 to 1.
   4. Cable Safety Device: Include a spring-loaded steel or bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if lifting cable breaks.
   5. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.
   6. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

K. Electric Door Operator: Electric door operator assembly of size and capacity recommended by door manufacturer for door and operation cycles specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
   1. Comply with NFPA 70.
   2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24 V ac or dc.
   3. Safety: Listed in accordance with UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 ft. or lower.
   4. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
   5. Operator Type: Manufacturer's standard for door requirements.

6. Motor: Reversible-type with controller (disconnect switch) for interior, clean, and dry motor exposure. Use adjustable motor-mounting bases for belt-driven operators.
   a. Motor Size: As required to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
   b. Electrical Characteristics: As indicated on Electrical Drawings.
7. Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
8. Obstruction Detection: Automatic external entrapment protection consisting of automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
   a. Monitored Entrapment Protection: Photoelectric sensor designed to interface with door-operator control circuit to detect damage to or disconnection of sensor and complying with requirements in UL 325.
9. Control Station: Flush mounted, three-position (open, close, and stop) control.
   a. Operation: Key.
   b. Interior-Mounted Unit: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
10. Emergency Manual Operation: Push-up type designed so required force for door operation does not exceed 25 lbf.
11. Emergency Operation Disconnect Device: Hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
12. Motor Removal: Design operator so motor can be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

L. Metal Finish: Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
   1. Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
      a. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; in accordance with manufacturer's written instructions.

B. Tracks:
   1. Fasten vertical track assembly to opening jambs and framing with fasteners spaced not more than 24 inches apart.
   2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install automatic garage doors openers in accordance with UL 325.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks in accordance with manufacturer's written instructions.
   2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weather-resistant fit around entire perimeter.

D. Touchup Painting Galvanized Material: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A780/A780M.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 08 36 13

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Aluminum-framed entrance and storefront systems.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. Aluminum-framed entrance and storefront systems.

B. Product Data Submittals: For each product.
   1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Operating characteristics, electrical characteristics, and furnished accessories.

C. Shop Drawings:
   1. Plans, elevations, sections, full-size details, and attachments to other work.
   2. Details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   3. Full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrance and storefront systems, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.
   4. Connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
   5. Point-to-point wiring diagrams showing the following:
      a. Power requirements for each electrically operated door hardware.
      b. Location and types of switches, signal device, conduit sizes, and number and size of wires.
   6. Signed and sealed by the qualified professional engineer responsible for their preparation.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish.
   1. Size: Manufacturers' standard size.

E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

F. Delegated Design Submittals: For aluminum-framed entrances and storefront systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: For aluminum-framed entrance and storefront systems, accessories, and components, from manufacturer.
   1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront system.

B. Product Test Reports: For aluminum-framed entrance and storefront systems, for tests performed by a qualified testing agency.

C. Quality-Control Program: Developed specifically for Project, including fabrication and installation, in accordance with recommendations in ASTM C1401. Include periodic quality-control reports.

D. Delegated Design Engineer Qualifications: For aluminum-framed entrance and storefront systems.

E. Sample Warranties: For aluminum-framed entrance and storefront systems.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For aluminum-framed entrance and storefront systems.

B. Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront. Include ASTM C1401 recommendations for post-installation-phase quality-control program.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Entity that is certified under the North American Contractor Certification Program (NACC) and that employs installers and supervisors who are trained and approved by manufacturer.

B. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

C. Egress Door Inspector Qualifications:
   1. Inspector for field quality-control inspections of egress door assemblies to comply with qualifications set forth in NFPA 101, Ch. 7 "Means of Egress," Section "Means of Egress Components," Article "Inspection of Door Openings."

2. Inspector for field quality-control inspections of egress door assemblies to be certified under DHI's certification program as a Fire and Egress Door Assembly Inspector (FDAI) or a Certified Fire and Egress Door Assembly Inspector (CFDAI).

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

E. Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of storefront systems that include structural glazing.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrance and storefront systems that fail in materials or workmanship within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.
1. Deterioration includes, but is not limited to, the following:
a. Color fading more than 5 Delta E units when tested in accordance with ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D 4214.
c. Cracking, peeling, or chipping.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design aluminum-framed entrance and storefront systems.
1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing

engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrance and storefront systems representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Aluminum-framed entrance and storefront systems to withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
   2. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.
      c. Noise or vibration created by wind and thermal and structural movements.
      d. Loosening or weakening of fasteners, attachments, and other components.
      e. Failure of operating units.

C. Structural Loads:
   1. Wind Loads: As indicated on Drawings.
   2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
   1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.
   2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
      a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

E. Structural: Test in accordance with ASTM E330/E330M as follows:
   1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
   2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
   3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
   1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-

pressure differential of 20 percent of positive wind-load design pressure, but not less than 12 lbf/sq. ft..

G. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:
   1. Thermal Transmittance (U-factor):
      a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.32 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
      b. Entrance Doors: U-factor of not more than 0.56 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
   2. Solar Heat-Gain Coefficient (SHGC):
      a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.38 as determined in accordance with NFRC 200.
      b. Entrance Doors: SHGC of not more than 0.38 as determined in accordance with NFRC 200.
   3. Air Leakage:
      a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.
      b. Entrance Doors, Pair: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
   4. Condensation Resistance Factor (CRF):
      a. Fixed Glazing and Framing Areas: CRF for the system of not less than 65 as determined in accordance with AAMA 1503.

H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

I. Structural-Sealant Joints:
   1. Designed to carry gravity loads of glazing.

J. Structural Sealant: ASTM C1184. Capable of withstanding tensile and shear stresses imposed by structural-sealant-glazed, aluminum-framed entrance and storefront systems without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant to occur before adhesive failure.
   1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
   2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

2.3 ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. EFCO.

2. Kawneer Company, Inc.
3. OldCastle BuildingEnvelope (OBE).
4. Tubelite Inc.

B. Products/Manufacturers: Basis of design.
1. Doors: Series D302 Medium Stile ThermaStile Entrance Doors; EFCO.
2. Framing: System 960 Wall Thermal Shear Block Storefront; EFCO.

C. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Framing Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on two sides and structural sealant on two sides.
3. Glazing Plane: Front.
4. Finish: Color anodic finish.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
7. Steel Reinforcement: As required by manufacturer.

D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

F. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
1. Door Construction: 2-inch overall thickness, with minimum 0.188-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
2. Door Design: Medium stile; 3-1/2-inch nominal width.
3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
a. Provide nonremovable glazing stops on outside of door.
4. Finish: Match adjacent storefront framing finish.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 71 00 "Door Hardware."

B. Weather Stripping: Manufacturer's standard replaceable components.

1. Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.
2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

C. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

2.5 GLAZING

A. Glazing: Comply with Section 08 80 00 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

D. Structural Glazing Sealants: ASTM C1184 chemically curing silicone formulation that is compatible with system components with which it comes in contact; specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in storefront system indicated.
1. Color: As selected by Architect from manufacturer's full range of colors.

E. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.
1. Color: Match structural sealant.

2.6 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Structural Profiles: ASTM B308/B308M.

D. Steel Reinforcement:
1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   2. Reinforce members as required to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system, fabricated from 300 series stainless steel.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

C. Concealed Flashing: Dead-soft, 0.018-inch- thick stainless steel, complying with ASTM A240/A240M, of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

E. Rigid PVC filler.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from exterior.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
   1. At interior and exterior doors, provide compression weather stripping at fixed stops.

G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
   1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
   2. At exterior doors, provide weather sweeps applied to door bottoms.

H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

I. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.9 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
   1. Color: Dark bronze.

2.10 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:
   1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
   2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 07 92 00 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.

K. Install entrance doors to produce smooth operation and tight fit at contact points.
   1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
   2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

L. Install glazing as specified in Section 08 80 00 "Glazing."

M. Install structural glazing as follows:
   1. Prepare surfaces that will contact structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
   2. Set glazing into framing in accordance with sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.
   3. Set glazing with proper orientation so that coatings face exterior or interior as specified.
   4. Hold glazing in place using temporary retainers of type and spacing recommended by manufacturer, until structural sealant joint has cured.
   5. Apply structural sealant to completely fill cavity, in accordance with sealant manufacturer and framing manufacturer's written instructions and in compliance with local codes.
   6. Apply structural sealant at temperatures indicated by sealant manufacturer for type of sealant.
   7. Allow structural sealant to cure in accordance with manufacturer's written instructions.
   8. Clean and protect glass as indicated in Section 08 80 00 "Glazing."

9. After structural sealant has completely cured, remove temporary retainers and insert backer rod between lites of glass as recommended by sealant manufacturer.
10. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.

3.3 ERECTION TOLERANCES

A. Install aluminum-framed entrance and storefront systems to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
   2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
   3. Alignment:
      a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
      b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
      c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
   4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests.

B. Tests: Perform the following tests on representative areas of aluminum-framed entrance and storefront systems.
   1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect to be tested in accordance with AAMA 501.2 and to not evidence water penetration.
      a. Perform a minimum of two tests in areas as directed by Architect.
      b. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.
   2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
      a. Perform a minimum of two tests in areas as directed by Architect.
      b. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.
   3. Structural-Sealant Adhesion: Test structural sealant in accordance with recommendations in ASTM C1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
      a. Test a minimum of two areas on each building facade.
      b. Repair installation areas damaged by testing.

C. Inspection Agency: Owner will engage a qualified inspector to perform inspections.

D. Inspections:
   1. Egress Door Inspections: Inspect each aluminum-framed entrance door equipped with panic hardware, located in an exit enclosure, electrically controlled, and equipped with special locking arrangements, in accordance with NFPA 101, Ch. 7 "Means of Egress," Section "Means of Egress Components," Article "Inspection of Door Openings."

E. Aluminum-framed entrance and storefront systems will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 08 41 13

SECTION 08 41 23 – FIRE-RATED STEEL FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

SUMMARY

A. Section includes:
   1. Fire-rated glazing and framing systems for installation as vision lights in fire-rated doors, full vision fire-rated doors, sidelights, and wall sections in interior openings

REFERENCES

B. American Architectural Manufacturers Association (AAMA)
   1. AAMA 501.1-2005: Standard Test Method for Water Penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure
   2. AAMA 501.2-2003: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
   3. AAMA 501.5-2005: Test Method for Thermal Cycling of Exterior Walls
   4. AAMA 1503-1998: Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
   5. AAMA 2603-2002 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   6. AAMA 2604-2005 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   7. AAMA 2605-2005 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. American Society for Testing and Materials (ASTM):
   1. Fire safety related:
      a. ASTM E119: Methods for Fire Tests of Building Construction and Materials.
   2. Material related
      a. ASTM A1008/ A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007.
      b. ASTM A1011/ A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.
   3. Sound related:
      a. ASTM E90-04: Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
      b. ASTM E413-04: Standard Classification for Rating Sound Insulation

D. American Welding Society (AWS)
   1. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007

E. Builders Hardware Manufacturers Association, Inc
   1. BHMA A156 - American National Standards for door hardware; 2006 (ANSI/BHMA A156).

F. National Fire Protection Association (NFPA):
   1. NFPA 80: Standard for Fire Doors and Windows.
   2. NFPA 252: Standard of Methods of Fire Tests of Door Assemblies
   3. NFPA 257: Standard for Fire Test of Window Assemblies

G. Underwriters Laboratories, Inc. (UL):
   1. UL 9: Fire Tests of Window Assemblies
   2. UL 10 B: Fire Tests of Door Assemblies
   3. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies
   4. UL 263: Fire tests of Building Construction and Materials
   5. UL 752: Ratings of Bullet-Resistant Materials

H. American National Standards Institute (ANSI):
   1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

I. Consumer Product Safety Commission (CPSC):
   1. CPSC 16 CFR 120: Safety Standard for Architectural Glazing Materials

J. American Society of Civil Engineers (ASCE)
   1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005

1.2 DEFINITIONS

A. Manufacturer: A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.

SUBMITTALS

B. Product Data:
   1. Technical Information: Submit latest edition of manufacturer’s product data providing product descriptions, technical data, Intertek Testing Services (ITS), listings and installation instructions.

C. Shop Drawings:
   1. Include plans, elevations and details of product showing component dimensions; framed opening requirements, dimensions, tolerances, and attachment to structure

D. Hardware schedule: list of manufacturer supplied hardware and verification of cylinder size complying with Section 08 71 00

E. Samples: For following products:
   1. Glass sample-as provided by manufacturer
   2. Sample of frame

3. Verification of sample of selected finish

F. Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

G. Warranties: Submit manufacturer's warranty.

H. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
1. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to
1. International Accreditation Service for a Type A Third-Party Inspection Body (Field Services ICC-ES Third-Party Inspections Standard Operating Procedures, 00-BL-S0400 and S0401)
2. International Accreditation Service for Testing Body-Building Materials and Systems
a. Fire Testing
1) ASTM Standard E119
2) CPSC Standard 16 CFR 1201
3) NFPA Standards 251, 252, 257
4) UL Standards 9, 10B, 10C, 1784

B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

C. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

D. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by ITS, for fire ratings indicated, based on testing according to NFPA 252, ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.

E. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by ITS, for fire ratings indicated, based on testing according to NFPA 257, ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.

F. Fire-Rated Wall Assemblies: Assemblies complying with ASTM E119 that are classified and labeled by ITS, for fire ratings indicated, based on testing in accordance with UL 263, ASTM E119.

G. Listings and Labels – Fire-Rated Assemblies: Under current follow-up service by Intertek Testing Services (ITS) maintaining a current listing or certification. Label assemblies in accordance with limits of manufacturer's listing.

H. Regulatory Requirements: Comply with provisions of the following:
   1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1, as follows:
      a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
      b. Door Closers: Comply with the following maximum opening-force requirements indicated:
         1) Accessible doors no more than 5 lbf push or pull force
         2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction
   2. NFPA 101: Comply with the following for means of egress doors:
      a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
      b. Door Closers: Not more than 30 lbf to set door in motion and not more than 15 lbf to open door to minimum required width.
   3. IBC 2012 Chapter 10 Means of Egress: Comply with the following for means of egress doors:
      a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
      b. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbfo open door to minimum required width.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle under provisions specified by manufacturer.

1.5 PROJECT CONDITIONS

A. Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the work of other sections.
   1. Note whether field or planned dimensions were used in the creation of the shop drawings.

B. Coordinate the work of this section with others effected including but not limited to: other interior and/or exterior envelope components and door hardware beyond that provided by this section

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of fire-rated steel framed entrance and storefront systems, including glass, that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS – FIRE-RATED DOOR ASSEMBLY AND WALL ASSEMBLY

A. Product/Manufacturer: Basis of design.
   1. Manufacturer Glazing Material: "AGC Pyrobel by McGrory Glass®" fire-rated glazing as fabricated and distributed by McGrory Glass.
   2. Frame System: "forster fuego light by McGrory Glass" fire-rated steel frame system as manufactured and supplied by McGrory Glass.

2.2 PERFORMANCE REQUIREMENTS

A. Fire Rating Requirements
   1. Duration -- Doors: Capable of providing a fire rating for 90 minutes.
   2. Duration-- Windows: Capable of providing a fire rating for 120 minutes.
   3. Duration-- Walls: Capable of providing a fire rating for [60], [90], 120 minutes

B. Design Requirements
   1. Dimensions – Door and Framing:
      a. Door framing face dimension: 2-3/8-inch.
      b. Depth of door framing: 2-9/16-inch.
      c. Door style face dimension: 3-9/16-inch.
      d. Door cross rail face: 3-9/16-inch.
      e. Depth of stile, header, sill and cross rail: 2 9/16-inch
   2. Dimensions -- Window Assembly:
      a. Perimeter framing face dimension: 2-3/4-inch at head, sill and jamb.
      b. Horizontal and/or vertical mullions: 3-9/16-inch on the face.
      c. Depth of perimeter and mullion: depth varies based on rating and profile
   3. Construction: Narrow-profile, roll-formed steel architectural grade specialty fire doors. Conventional break-shape type hollow metal steel fire-rated doors will not be considered an acceptable substitute.
      a. Knock down frames are not permitted.

2.3 MATERIALS - GLASS

A. Fire-Rated Glazing: Composed of multiple sheets of low iron, high-visible-light transmission glass laminated with intumescent interlayers.

B. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).

C. Properties Interior Glazing

Property				
Fire Rating			90 minutes	120 minutes
Manufacturer's designation			90-30EG6	120-54
Glazing type			single	single
Nominal Thickness			1-7/16" (36.7mm)	2-1/8" (54mm)
Weight in lbs/sf			17.4lbs/sf	25.4lbs/sf
Daylight Transmission			86%	83%
Sound Transmission Coefficient			44dB	49dB

D. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (ITS), fire rating period, safety glazing standards, and date of manufacture.

E. Glazing Accessories: Manufacturer's standard compression gaskets, spacers, setting blocks and other accessories necessary for a complete installation.

2.4 MATERIALS – STEEL FRAMES AND DOORS

A. Steel Framing System 120 min:
1. Frame: Steel profiled formed tubing permanently joined with steel bolts.
2. Insulation: Insulate framing system against effects of fire, smoke, and heat transfer from either side. Insulate profiled steel tubing using a shell construction that incorporates Promatect-H intermediate interlayer. Firmly pack perimeter of framing system to rough opening with mineral wool fire stop insulation or appropriately rated intumescent sealant.
3. Steel Glazing Beads: Extruded steel beads with dimensions recommended by manufacturer to securely hold glazing material in place.
4. Fasteners: Type recommended by manufacturer
5. Glazing Accessories: Set AGC Pyrobel® by McGrory Glass using calcium silicate or setting blocks.
6. Glazing Gaskets: Glaze AGC Pyrobel® by McGrory Glass with approved EPDM glazing gaskets.

B. Steel Door System 90 min:
1. Manufacturer's standard [single leaf] and [double leaf] door[s] with manufacture's standard hardware
2. Coordinate door hardware with cylinder specified in Section 08 71 00 Hardware

2.5 FABRICATION

A. Furnish interior frame assemblies.
   1. When necessary, splice frames too large for shop fabrication or shipping or to fit in available building openings.
   2. Fit with suitable fasteners.
   3. Knock-down doors and door perimeter frames are not permitted

B. Field glaze door and frame assemblies.

C. Factory prepare steel door assemblies and install all hardware.

D. Fabrication Dimensions: Fabricate fire-rated assembly to field dimensions.

E. Obtain approved Shop Drawings prior to fabrication.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish frames after assembly.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.7 POWDER COAT FINISHES

A. Finish after fabrication.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

C. Interior Steel Finishes
   1. Powder-Coat Finish: Polyester Super Durable powder coating which meets AAMA 2604 for chalking and fading. Apply manufacturer's standard powder coating finish system applied to factory-assembled frames before shipping, complying with manufacturer's recommended instructions for surface preparation including pretreatment, application, and minimum dry film thickness.
   2. Color and Gloss: Custom color to match Architect's sample.
   3. Acceptable Manufacturers:
      a. Axalta Powder Coating Systems, LLC.
      b. Additional manufacturers as approved by McGrory Glass.

2.8 DOOR HARDWARE

A. Door Hardware: Hardware not specified in this Section is specified in Section 08 71 00 "Door Hardware."

2.9 ACCESSORY MATERIALS

A. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.

B. Provide openings plumb, square and within allowable tolerances.
   1. The manufacturer recommends 3/8 inch shim space at all walls

C. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.

D. Do not proceed until such conditions are corrected.

3.2 INSTALLATION

A. Comply with manufacturer's Installation Manual.

3.3 REPAIR AND TOUCH UP

A. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
   1. Such repairs shall match original finish for quality or material and view.

B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.4 ADJUSTING

A. Adjust door function and hardware for smooth operation. Coordinate with other hardware suppliers for function and use of any other attached hardware.

3.5 PROTECTION AND CLEANING

A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
   1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
   2. Do not use any of the following:
      a. Steam jets
      b. Abrasives
      c. Strong acidic or alkaline detergents, or surface-reactive agents

d. Detergents not recommended in writing by the manufacturer
e. Do not use any detergent above 77 degrees F
f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
g. Metal or hard parts of cleaning equipment must not touch the glass surface

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

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SECTION 08 44 23 - STRUCTURAL-SEALANT-GLAZED CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Four-sided structural-sealant-glazed curtain-wall assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For structural-sealant-glazed curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
   1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   2. Include full-size isometric details of each type of vertical-to-horizontal intersection of structural-sealant-glazed curtain walls, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.
   3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
   1. Joinery, including concealed welds.
   2. Anchorage.
   3. Expansion provisions.
   4. Glazing.
   5. Flashing and drainage.

F. Delegated-Design Submittal: For structural-sealant-glazed curtain walls, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data:
   1. For Installer.
   2. For professional engineer's experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the state in which Project is located.

B. Energy Performance Certificates: For structural-sealant-glazed curtain walls, accessories, and components from manufacturer.
   1. Basis for Certification: NFRC-certified energy performance values for each structural-sealant-glazed curtain wall.

C. Product Test Reports: For structural-sealant-glazed curtain walls, for tests performed by a qualified testing agency.

D. Quality-Control Program: Developed specifically for Project, including fabrication and installation, in accordance with recommendations in ASTM C1401. Include periodic quality-control reports.

E. Source quality-control reports.

F. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For structural-sealant-glazed curtain walls to include in maintenance manuals.

B. Maintenance Data for Structural Sealant: For structural-sealant-glazed curtain walls to include in maintenance manuals. Include ASTM C1401 recommendations for post installation-phase quality-control program.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors.

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

C. Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of structural-sealant-glazed curtain-wall assemblies.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of structural-sealant-glazed curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including, but not limited to, excessive deflection.
      b. Noise or vibration created by wind and thermal and structural movements.
      c. Water penetration through fixed glazing and framing areas.
      d. Failure of operating components.
   2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.
   1. Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
      b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
      c. Cracking, peeling, or chipping.
   2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design structural-sealant-glazed curtain walls.
   1. Professional Engineering Qualifications: A professional engineer who is legally qualified to practice in New York State and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems or assemblies that are similar to those indicated for this Project in material, design, and extent.

B. General Performance: Comply with performance requirements specified, as determined by testing of structural-sealant-glazed curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Structural-sealant-glazed curtain walls shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
   2. Failure also includes the following:
      a. Thermal stresses transferring to building structure.
      b. Glass breakage.

c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

C. Structural Loads:
1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans of greater than 13 feet 6 inches.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
3. Cantilever Deflection: Limited to 2L/175 at unsupported cantilevers.

E. Structural: Test in accordance with ASTM E330/E330M as follows:
1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft..

G. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:
1. Thermal Transmittance (U-factor):
a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.30 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
2. Solar Heat Gain Coefficient (SHGC):
a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.38 as determined in accordance with NFRC 200.
3. Air Leakage:
a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.

4. Condensation Resistance Factor (CRF):
   a. Fixed Glazing and Framing Areas: CRF for the system of not less than 61 as determined in accordance with AAMA 1503.

H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

I. Structural-Sealant Joints:
1. Designed to carry gravity loads of glazing.

J. Structural Sealant: ASTM C1184. Capable of withstanding tensile and shear stresses imposed by structural-sealant-glazed curtain walls without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

2.2 SOURCE LIMITATIONS

A. Obtain all components of structural-sealant-glazed curtain-wall system, including framing and accessories, from single manufacturer**.**

2.3 FOUR-SIDED STRUCTURAL-SEALANT-GLAZED CURTAIN-WALL ASSEMBLIES

A. Product/Manufacturer: Basis of design.
1. System 5600, 2-1/2-inch Curtain Wall (4-Sided SSG); EFCO Corporation.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. EFCO Corporation.
2. Kawneer North America, an Arconic company.
3. Oldcastle Building Envelope (OBE); CRH Americas.

C. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Glazing System: Retained with structural sealant on four sides.
2. Finish: Color anodic finish.
3. System: Either unitized or stick.
4. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
5. Steel Reinforcement: As required by manufacturer.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 GLAZING

A. Comply with Section 08 80 00 "Glazing."

B. Glazing Gaskets:
1. ASTM C509 or ASTM C864. Manufacturer's standard.
a. Color: Black.

C. Glazing Sealants:
1. As recommended by manufacturer.

D. Structural Glazing Sealants: ASTM C1184, chemically curing silicone formulation that is compatible with system components with which it comes into contact, specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in structural-sealant-glazed curtain-wall assembly indicated.
1. Color: As selected by Architect from manufacturer's full range of colors.

E. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes into contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed curtain-wall manufacturers for this use.
1. Color: Match structural sealant.

2.5 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Structural Profiles: ASTM B308/B308M.

D. Steel Reinforcement:
1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.6 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   2. Reinforce members as required to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system , fabricated from 300 series stainless steel.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

C. Concealed Flashing: Dead-soft, 0.018-inch- thick stainless steel, ASTM A240/A240M of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from exterior.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Factory-Assembled Frame Units:
   1. Rigidly secure nonmovement joints.
   2. Prepare surfaces that will contact structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
   3. Seal joints watertight unless otherwise indicated.
   4. Install structural glazing.

a. Set glazing into framing in accordance with sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.
b. Set glazing with proper orientation, so that coatings face exterior or interior as specified.
c. Apply structural silicone sealant to completely fill cavity, in accordance with sealant manufacturers written instructions with the framing and glazing in a fully supported position.
d. Brace or stiffen framing and glazing in such a manner to prevent undue stresses on the glass edge seal and structural joints or movement of the glazing, until sealant is fully cured in accordance with manufacturer's recommendations.
e. After structural sealant has completely cured, insert backer rod between lites of glass as recommended by sealant manufacturer.
f. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.
g. Clean and protect glass as indicated in Section 08 80 00 "Glazing."
h. Retain bracing or stiffening until erected to prevent racking of units during transportation and erection.

E. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.8 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
1. Color: Dark bronze.

2.9 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF STRUCTURAL-SEALANT-GLAZED CURTAIN WALLS

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

G. Seal joints watertight unless otherwise indicated.

H. Metal Protection:
   1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
   2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

I. Install components plumb and true in alignment with established lines and grades.

J. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

3.3 ERECTION TOLERANCES

A. Install structural-sealant-glazed curtain walls to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
   2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
   3. Alignment:
      a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
      b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
      c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
   4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.

B. Test Area: Perform tests on one bay at least 30 feet, by one story.

C. Field Quality-Control Testing: Perform the following test on representative areas of structural-sealant-glazed curtain walls.
   1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested in accordance with AAMA 501.2 and shall not evidence water penetration.
      a. Perform a minimum of two tests in areas as directed by Architect.
   2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in Part 2 "Performance Requirements" Article but not more than 0.50 cfm/sq. ft..
      a. Perform a minimum of two tests in areas, as directed by Architect.
   3. Water Penetration: ASTM E1105 at a minimum uniform static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in Part 2 "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.

D. Structural-Sealant Adhesion: Test structural sealant in accordance with recommendations in ASTM C1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
   1. Test a minimum of two areas on each building facade.
   2. Repair installation areas damaged by testing.

E. Structural-sealant-glazed curtain walls will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 08 44 23

SECTION 08 71 00 – DOOR HARDWARE

Part 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes but not limited to the following:

1. Mechanical and/or electrical hardware.
2. Cylinders for hardware specified in other sections.

B. Related Requirements

1. Division 1 Section "Sustainable Design Requirements".
2. Division 01 Section “Closeout Procedures”
3. Division 06 Section “Rough Carpentry”.
4. Division 06 Section “Finish Carpentry”.
5. Division 08 Section “Hollow Metal Doors and Frames”.
6. Division 08 Section “Interior Aluminum Doors and Frames”.
7. Division 08 Section “Flush Wood Doors”.
8. Division 08 Section “Clad Wood Doors”.
9. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
10. Division 08 Section “Automatic Door Operators”.
11. Division 28 Section “Access Control”.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

1.3 COORDINATION

A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate

provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1. Coordinate single accessible location of power supplies by floor with the owners representative.

D. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.4 COORDINATION AND MEETINGS

A. Location: Conduct conferences on project site or other location as directed by the Architect/Owner.

B. Preinstallation Conference

1. Purpose of the Preinstallation conference is to:

a. Coordinate between trades, so all understand their responsibilities.
b. To instruct the installation contractors' personnel on the proper installation and adjustment of their respective products.
    1. The hardware supplier is responsible for bringing the installation instructions to the meeting.
c. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
d. Review sequence of operation narratives for each unique access-controlled opening.
e. Review the requirements for local and state building codes and how they apply to doors, frames, and hardware.
    1. Gap requirements around the doors to follow NFPA 80.
    2. Opening forces to follow DOJ’s “2010 ADA Standards for accessible design”.
f. Review any special applications.

2. Conference participants shall include but not limited to:

a. General Contractor.
b. Installer for doors, frames, and hardware.
c. Supplier Representative.
d. Owner and/or Owners Representative.

e. Electrical Contractor (if applicable).
f. System Integrator (if applicable).
g. Construction Manager (if applicable).
h. Architect and/or Architects Consultant.

C. Keying Conference:

8. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:
   a. Flow of traffic and degree of security required.
   b. Preliminary key system schematic diagram.
   c. Requirements for key control system.
      1) This is to include the number of keys per keyset.
      2) Number of Master level keys.
      3) Use of keyed construction cores.
   d. Requirements for access control.
   e. Address for delivery of keys.
9.
   1. Keying Conference participants shall include but not limited to:

      a. Supplier Representative.
      b. Owner and/or Owners Representative.
      c. Architect and/or Architects Consultant.

D. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

1.5 SUBMITTALS

10. Submittal Sequence to follow in this order and each are to be submitted under separate cover:
11. Information Submittal.
12. Door Hardware Schedule.
13. Hardware Product Data.
14. Samples.
15. Riser Diagrams.
16. Keying Schedule (Only after the keying meeting has taken place).
17. Wiring Diagrams (Only after final approval of the hardware has been received).
18. Closeout Submittals.
19. Submit door hardware schedule concurrent with submissions of Product Data, Samples, Riser Diagrams.
20. Information Submittals:
    1. Qualification Data: Submit qualification data for the Installer and Supplier as defined under Quality Assurance of the Section.
    2. Product Certifications:
       a. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Use same scheduling sequence and use same door numbers as in the Contract Documents.

   2. Content: Include the following information:
      a. Index of openings showing hardware set assignments.
      b. Identification number, location, hand, fire rating, size, degree of opening, and material of each door and frame.
      c. Locations of each door hardware set, cross-referenced to floor plans, and to door and frame schedule.
      d. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      e. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
      f. Fastenings and other installation information.
      g. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
      h. Mounting locations for door hardware.
      i. Complete list of related door devices specified or supplied in other Sections for each door and frame.

C. Riser Diagrams: Required for each opening that has electronic hardware and to incorporate the following:
   1. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   2. Index of openings showing hardware set assignments.
   3. Identification number, location, hand, fire rating, size, degree of opening, and material of each door and frame.
   4. Locations of each door hardware set, cross-referenced to floor plans, and to door and frame schedule.

D. Door Hardware Product Data: Prepared by or under the supervision of supplier.
   1. Provide an index of products used grouped by manufacturer.
   2. Each product shall be highlighted or marked accordingly.
      a. Do not include pages or products that are not applicable to the project. If they appear on the same page as a product being used, they shall be crossed out.
   21. Samples:
   22. Provide a finish sample for each exposed product in each finish specified, in manufacturer's standard size.

3. Tag Samples with full product description to coordinate samples with the door hardware schedule.

23. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

4. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
5. Complete (point-to-point) access control system block wiring diagrams.
6. Wiring instructions for each electronic component scheduled herein.

24. Keying Schedule: Only after a keying meeting with the owner has taken place, prepare a keying schedule detailing final instruction. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions.

25. The owner completes keyed core combinations with the supplier of the keying system. The final cores are sent directly to the owner to install.

E. Closeout Submittals:

1. After final approval is received from the architect, submit a Record Copy of the Door and Hardware Schedule with all the content as previously required.
   a. Submittal must be stamped “RECORD COPY.”
   b. The Record Copy will be given to the installer for the installation of the hardware.

2. Warranty Submittal: Warranty information to include the following information:
   a. Original factory order number.
   b. Date order was placed.
   c. Date of installation (approximately if unknown).

3. Operating and Maintenance Manuals:
   a. Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

4. Wiring Diagrams:
   a. Provide “as-built” wiring diagrams with all the information as required previously.
   b. Show any modifications that were made in the field.

F. Submittals that do not comply with all the requirements above will be rejected and will have to be resubmitted. Any project delays caused by incorrect/incomplete submittals will be the responsibility of the General Contractor and Hardware Supplier.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:

1. A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Door Hardware Supplier Qualifications:

1. Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project.
2. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity.
3. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1.7 DELIVERY AND STORAGE

A. All hardware for field installation shall be delivered to the project site.

1. Any hardware that is required to be factory installed shall be delivered to the factory at the cost of the supplier of the doors or frames requiring the factory installation.

B. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.

1. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
2. The storage area must maintain low humidity and a temperature between 60 to 90 degrees Fahrenheit.

C. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

D. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten (10) years for mechanical mortise locks.
2. Ten (10) years for mechanical cylindrical locks.
3. Five (5) years for mechanical exit hardware.
4. Thirty (30) years for mechanical, manual overhead door closers.
5. Two (2) years for electromechanical door hardware.

1.9 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

Part 2 – PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOJ's "2010 ADA Standards for Accessible Design".

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
   a. Interior, Hinged Doors: 5 lbf applied perpendicular to door.
   b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
   c. Provide thresholds not more than 1/2 inch high.
   d. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
   e. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. For products furnished, but not installed, under this Section, Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

C. Equals: Requests for equals and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

D. Substitutions: Are not allowed unless the specified product(s) are no longer available.

2.4 HINGES

A. Hinges are to meet or exceed ANSI/BHMA A156.1 requirements.

B. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

C. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

1. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
2. Sizes from 3’1” to 4’0”: 5” heavy weight.

D. Hinge Type: Provide the type listed in the hardware sets.

E. Hinge Options:

1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
2. Electrical: Provide Molex style connectors on both sides of the hinge using the number of wires required for proper operation.
3. Hospital Tips: Top of each hinge to be cut at a 45 Degree angle and finished smoothly to help support a safer and cleaner environment.

F. Manufacturers:

1. Hager Companies (HA).
2. McKinney Products (MK).
3. Stanley Hardware (ST).

2.5 CONTINUOUS HINGES

A. General Requirements:

1. Continuous Hinges are to meet or exceed ANSI/BHMA A156.26 Grade 1 Requirements.
2. Fabricated to full height of door and to template screw locations; with components finished after milling and drilling are complete.
3. Hinges are to be non-handed.
4. Factories to prepare for electrical cut-outs.
5. Hinge Type: Provide the type listed in the hardware sets.
6. Coordinate with door manufacturers for the exact type required, as it varies between door manufacturers and application.
7. Fasteners: All of the fasteners are to be fabricated from corrosion resistant materials.

a. Provide either 12-24 x 3/4" self-drilling, thread-forming or 12-24 x 1/2" thread-forming screws that are made of 410 stainless steel with an undercut head.

8. Electrical Options: Provide Molex style connectors on both sides of the hinge using the number of wires required for proper operation.

B. Continuous, Gear-Type Hinges:

1. Manufactured out of 6063-T6 extruded-aluminum, pin-less, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating bearings.
2. Manufacturers:

a. Architectural Builders Hardware (AH).
b. Hager Companies (HA).
c. Markar (MK).
d. Select (SE)

2.6 POWER TRANSFER DEVICES

A. Electric Door and Frame Wiring Harnesses:

1. Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening.
2. Wire nut connections are not acceptable.
3. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
4. Manufacturers:

a. Architectural Builders Hardware (AH) EZ Series.
b. Stanley Hardware (ST). WH-Series
c. Von Duprin (VD) CON Series.

2.7 MANUAL FLUSH AND SURFACE BOLTS

A. Bolts are to meet or exceed ANSI/BHMA A156.3 and A156.16, Grade 1 requirements.

B. Furnish Dustproof Strikes for all bottom bolts.

C. Provide related accessories or mounting brackets as required for appropriate installation and operation.

D. Manufacturers:

1. Architectural Builders Hardware (AH).
2. Rockwood Manufacturing (RO).
3. Trimco (TC).

2.8 OPERATING TRIM

A. Door Push Plates and Pulls: are to meet or exceed ANSI/BHMA A156.6 requirements.

B. Coordinate and provide proper width and height as required where conflicting hardware dictates.

C. Provide a minimum clearance of 2 ½" from face of door.

D. Provide Heavy Duty Concealed Fasteners where possible. Coordinate type required with door material.

E. Manufacturers:

1. Architectural Builders Hardware (AH).
2. Rockwood Manufacturing (RO).
3. Trimco (TC).

2.9 CYLINDERS AND KEYING

A. Cylinders: Original manufacturer cylinders complying with the following:

1. Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
2. Meet or exceed ANSI/BHMA A156.5 Grade 1 requirements.
3. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
4. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   a. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes. Stamped collars are not allowed.
5. Face finished to match lockset.
6. Core Type: Interchangeable.

B. Construction Cores:

1. Construction Cores: Provide keyed construction cores that are replaceable by permanent cores.
   a. Provide 10 construction master keys.
   b. Provide 2 Construction Core Removal Keys.

C. Key Registration List:

1. Provide transcript list in writing or electronic file (proper format) as directed by the Owner.
2. Furnish a list of opening numbers with locking devices, showing cylinder types and quantities required when cylinders or cores are to be owner furnished.

D. Manufacturers:

1. Best (BE). Supplied by the owner NO SUBSTITUTION

E. Cylindrical Locks:

1. Locks shall meet or exceed ANSI/BHMA A156.2 Series 4000 Operation Grade 1 requirements.
2. Locks are to be non-handed and fully field reversible.
3. Lock Throw:
   a. ½" throw at single openings.
   b. ¾" throw at rated paired openings.
4. Backset:
   a. 2-3/4" unless noted otherwise.
5. Lock trim and function as shown in hardware sets.
6. Latchbolt:
   a. Provide deadlocking latchbolt for all locks with a keyed function.
7. Electrified Locks: Where indicated in the Hardware Sets provide the following:
   a. Provide lock bodies which can operate on either 12 or 24 volts, field selectable.
   b. Locks are to be field configurable for fail safe or fail secure operation.
   c. Where indicated in the Hardware Sets, provide electrified options including:
      1. Lock/unlock trim control.
      2. Latchbolt and lock/unlock status monitoring.
      3. Request-to-exit signaling.
8. Manufacturers:

   a. Best (BE) 9K Series. BASIS OF DESIGN
   b. Sargent Manufacturing (SA) 10X Line.
   c. Schlage (SC) ND Series.

F. Narrow Backset Mortise Locksets:
1. Locksets are to be manufactured with a stainless-steel case.
2. Lock trim and function as shown in hardware sets.
3. Manufacturers:

   a. Accurate (AC) 1700 Series.

G. Mortise Deadlocks:

1. Small Case Deadlocks shall meet or exceed ANSI/BHMA 156.36, Grade 1 requirements.
2. Lock function as shown in hardware sets.
3. Deadlocks are to be manufactured with a corrosion resistant steel case.
4. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins.
5. Manufacturers:

    a. Best (BE). BASIS OF DESIGN
    b. Sargent Manufacturing (SA).
    c. Schlage (SC).

2.10 LOCK AND LATCH STRIKES

A. Standards:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

B. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame.

C. Finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
    a. Provide at paired openings with metal edges and astragals.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Dustproof Strikes: Provide for all bottom flush bolts or latches, exit devices, and where thermal pins are required from the door to the floor at fire rated openings.

2.11 ELECTRIC STRIKES

A. Electric strikes shall meet or exceed ANSI/BHMA A156.31, Grade 1 requirements.

1. Shall be for use on non-rated or fire-rated openings.
2. Strikes shall be tested to a minimum endurance of 1 million operating cycles.
3. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified.
4. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.
5. Manufacturers:

6. HES (HS).
7. Security Door Controls (SD).
8. Trine (TR).

2.12 EXIT DEVICES

A. Exit Devices and Auxiliary Items shall meet or exceed ANSI/BHMA A156.3, Grade 1 requirements.

B. On fire rated doors, provide Exit Devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware".

C. Exit Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar.

1. Provide solid filler plate(s) where gap behind the Exit Device exists.
2. When used on full glass door applications provide a filler plate that fills in the gap between the Exit Device and the Glass.

D. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets.

1. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

E. Provide exit latches with deadlocking feature.

F. Where function of the Exit Device requires a cylinder, provide a cylinder per the requirements of the Keying System.

G. Function and Trim design as listed in the Hardware Sets.

H. Provide mounting brackets or spacers as required for proper installation and operation.

I. Where Vertical Rod Exit Devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated.

1. Provide dust proof strikes where thermal pins are required to project into the floor.

J. Provide Through Bolts for All Exit Devices installed on wood doors.

K. Do not cut perimeter gasket to mount the Exit Device Strikes. Adjust template accordingly.

L. Coordinate the mounting centerline of the Exit Devices with the Door Elevations.

1. Exit Devices shall not be mounted over vision kits, unless approved by the Architect.

M. Removable Mullions:

1. On fire rated doors, provide mullions complying with NFPA 80 and UL labeling requirements.
2. Provide Key removable mullions as specified in the Hardware Sets.
   a. Cylinders to be providing per the requirements of the Keying System.
3. Provide mullion stabilizers.
4. Provide mounting brackets as required for proper installation and operation.
5. Where aluminum mullions are specified, the finish is to match the finish of the aluminum door and/or framing, submit finish color for approval.
6. Where electric strikes are used on the mullions, provide an electrical quick disconnect in the mullion along with signage stating, “Use Caution Electrical Wires Inside.”
7. When installing Mullions in Aluminum or Fiberglass Framing, install using Rivnuts and Stainless-Steel machine screws.

N. Manufacturers:

1. Detex (DE) Advantex Series.
2. Sargent (SA) 80 Series.
3. Von Duprin (VD) 35A/98XP Series. BASIS OF DESIGN

2.13 SURFACE CLOSERS

A. Surface Closers shall meet or exceed ANSI/BHMA A156.4, Grade 1 requirements.

B. Surface Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

C. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.

D. Provide Surface Closers complying the Americans with Disabilities Act, ANSI ICC/A117.1.

E. Extended cycle test: Surface Closers to have been cycle tested to 10 million cycles.

F. Provide metal closer covers.

G. Closers shall not be installed on exterior or corridor side of doors.

1. Where a conflict exists, bring it to the attention of the Architect prior to installation.

H. Provide accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation and operation.

I. Coordinate with Overhead Holder/Stop installation, provide special templates as required to avoid hardware conflicts.

J. When installing Mullions in Aluminum or Fiberglass Framing, install using Rivnuts and Stainless-Steel machine screws.

K. Provide Through Bolts for Surface Closers installed on wood doors.

L. Manufacturers:

1. LCN (LC) 4040XP Series.
2. Norton (NO) 7500/9500 Series.
3. Sargent (SA) 1431/281 Series.

2.14 OVERHEAD STOPS AND HOLDERS

A. Stops and Holders shall meet or exceed ANSI/BHMA A156.8, Grade 1 requirements.

B. Provide units that are through bolted on all Wood Door applications.

C. Coordinate with door closer installation, special templating may be required.

D. Where stops and holders are specified, coordinate with door manufacturer to insure proper application, installation, and operation.

E. Function as show in Hardware Sets.

F. Manufacturers:

1. Architectural Builders Hardware (AH).
2. Glynn Johnson (GJ).
3. Rixson (RF).

2.15 ARCHITECTURAL TRIM

A. Protective Plates (kick):

1. Shall meet ANSI/BHMA A156.6 requirements.

2. Protective plates, fabricated from the following:
   a. Stainless Steel: 300 grade, 050-inch thick.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80.

4. Kick Plates are to be installed on the push side of the door, unless stated otherwise.

5. Mop Plates are to be installed on the pull side of the door.

6. Size: Fabricate protection plates not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

7. Provide Plates with countersunk screw holes.

8. Provide Plates are to be beveled on all 4 edges.

9. Height: 10”, unless noted otherwise.

10. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Rockwood Products (RO).
    c. Trimco (TC).

2.16 DOOR STOPS AND HOLDERS

A. Door Stops and Holders shall comply with ANSI/BHMA A156.16, Grade 1 requirements.

B. Provide wall bumpers, either convex or concave types as required.

C. Provide Door stops with anchorage required based upon wall or floor application.

D. Do not mount floor stops where they will impede traffic.

E. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

F. Manufacturers:

    1. Burns Manufacturing (BU).
    2. Rockwood Products (RO).
    3. Trimco (TC).

2.17 THRESHOLDS

A. Thresholds shall comply with ANSI/BHMA A156.21 requirements.

B. Thresholds shall be fabricated to full width of opening.

C. Provide non-slip surface.

D. Provide Stainless Steel Fasteners, type as detailed or required for specific floor conditions.

E. Manufacturers:

1. National Guard (NG).
2. Pemko (PE).
3. Reese (RE).

2.18 GASKETING

A. Door Gasketing shall comply with ANSI/BHMA A156.22 requirements.

B. Provide with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

C. Perimeter gasketing should not be cut around door hardware. Gaskets must maintain a continuous seal at the top and vertical edges. Adjust hardware templates accordingly.

D. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

E. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

F. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

G. Maximum Air Leakage: When tested according to ASTM E 283 with tested pressure differential of 0.3-inch wg (75 Pa), as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.

3. Gasketing on Double Doors: 0.50 cfm per foot (0.000774 cu. m/s per m) of door opening.

H. Manufacturers:

1. National Guard (NG).
2. Pemko (PE).
3. Reese (RE).

2.19 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

1. The use of Aluminum or Brass/Bronze based screws is not acceptable.

C. Fasteners: Provided by door hardware manufacturer, to comply with published installation instructions, templates and as test for fire rated applications.

1. The use of other fasteners will be rejected.

2. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

3. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners.

4. Where hardware is being attached to Aluminum or FRP doors and frames Rivnuts (Rivet Nuts) and machine screws must be used.

5. Exit Devices, Surface Door Closers, Pulls, and Overhead Stops that are installed on wood doors shall be installed using through-bolts.

6. Gasket Fasteners: Provide Stainless Steel fasteners.

7. Threshold Fasteners:

a. Concrete floors: Provide ¼-20 Stainless Steel Machine Screws and Expansion Shields.

b. Wood floors: Provide #10 Stainless Steel Wood Screws.

8. Continuous Hinge Fasteners:

a. All of the fasteners are to be fabricated from corrosion resistant materials.
b. Provide either 12-24 x 3/4" self-drilling, thread-forming or 12-24 x 1/2" thread-forming screws that are made of 410 stainless steel with an undercut head.

9. Butt Hinge Fasteners:

a. Provide screws our of steel or stainless Steel to match hinge base material.
b. Provide Wood Screws for wood door and frame applications.
c. Provide Machine Screws for metal door and frame applications.

2.20 FINISHES

A. Provide finishes complying with ANSI/BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Part 3 – EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware.

C. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

B. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

C. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors".
3. Comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities".

D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

E. Self-closing doors must close and latch completely from the fully opened position.

F. Lock Cylinders:

1. Install keyed construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as directed by Owner.

G. Thresholds: Set thresholds in full bed of sealant, and caulk around all edges, complying with requirements specified in Section 07 92 00 "Joint Sealants."

H. Gaps: Gaps around the head and vertical edges of the doors shall meet the following requirements:

1. Wood Doors: 1/8” top, vertical edge, and in between paired doors.

2. Hollow Metal Doors: 1/8” +/- 1/16” top, vertical edge, and in between paired doors.

3. Where shimming is required to adjust the gaps the shim material must be steel. Cardboard, paper, and other materials are not acceptable.

4. Bottom of door (Undercut) shall not exceed 1” on non-rated openings and ¾” on rated openings.

I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch or cut perimeter gasketing to install other surface-applied hardware.

J. Door Bottoms: Apply to bottom of door, forming seal with floor or threshold when door is closed.

K. Door Closers: Adjust closers to follow opening forces listed under this section’s Performance Requirements.

1. Degree of opening: Template the closer to allow for the maximum degree of opening the conditions will allow.

2. Back Check valve shall be adjusted so it engages 10 degrees prior to the door reaching full swing.

3. The Latch Speed valve shall be adjusted so the door latches properly without slamming.

4. When through-bolts are used on wood doors, do not overtighten, and crush the door. If this happens the door is to be replaced.

5. Where closers or arms are installed on Aluminum or FRP doors and/or frames, install using Rivnuts (Rivet Nuts).

L. Wall Bumpers or Stops: Note that blocking in drywall partitions where wall stops, or other wall mounted hardware is located is required.

M. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Lock Strikes: Where retrofitting into existing frames, field verify the frame condition prior to ordering strikes. Field modifications to accept new strike or custom Strikes may be required.

2. Existing holes: Where holes are left from old hardware in the door and/or frame they shall repaired in compliance with NFPA80 Section 5.5.7. Finished as required by Architect.

3.4 FIELD QUALITY CONTROL

A. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating, and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

B. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.
   1. Submit documentation of incomplete items in PDF electronic format.

C. Fire Door Assembly Inspection: Reference Division 01 Sections "Closeout Procedures" for stipulations requiring an initial fire door assembly inspection, including documentation reporting, upon completion of door hardware installation according to NFPA 80 Standard for Fire Doors and Other Opening Protectives, paragraph 5.2.4, requirements.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

   1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

3.8 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.9 DOOR HARDWARE SCHEDULE

A. The hardware sets represent the design intent and direction of the owner and architect. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process.

B. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required.

C. HARDWARE SETS:

Hardware Sets

Set: 1.0

1	Continuous Hinge	A240HD	C	AH
1	Rim Exit, Exit Only	LD 98 EO	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Closer, Spring Stop	UNI9500 M	689	NO
1	Gasketing	700SA		NG
1	Drip Strip	16A		NG
1	Door Bottom	95WH (provide 3/4" undercut)		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Alarm	EAX-4200SK		DE
1	Door Contact	Supplied By Owner		OT
1	Sign	Emergency Egress Only, Alarm Will Sound		DE

Notes: Theory of operation:
Door is to be closed at all times.
Alarm will go off immediately upon egress
The alarm can be shut off remotely or locally.
Free egress at all times.

Set: 2.0

1	Continuous Hinge	A160HD	C	AH
1	Rim Exit, Nightlatch	LD 33A L 360L(09) 06	626	VO
2	Rim Cylinder	12E-72 Patented	626	BE

1 Closer, Spring Stop	UNI9500 M	689	NO
1 Drip Strip	16A		NG
1 Perimeter Gasket	By Frame Manufacturer		OT
1 Sweep	1015V		NG
1 Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1 Alarm	EAX-4200SK		DE
1 Door Contact	Supplied By Owner		OT
1 Sign	Emergency Egress Only, Alarm Will Sound		DE

Notes: Theory of operation:
Door is to be closed at all times.
Alarm will go off immediately upon egress
The alarm can be shut off remotely or locally.
Free egress at all times.

Set: 3.0

1 Continuous Hinge	A240HD	C	AH
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Closer, Spring Stop	UNI9500 M	689	NO
1 Gasketing	700SA		NG
1 Drip Strip	16A		NG
1 Sweep	1015V		NG
1 Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1 Door Contact	Supplied By Owner		OT
1 Request to Exit	Supplied under Division 28		OT

Set: 4.0

1 Continuous Hinge, Electric	A160HD EA12-EZ	C	AH
1 Rim Exit, Exit Only	RXLC LD 33A EO CON	626	VO
1 Closer, Spring Stop	UNI9500 M	689	NO
1 Drip Strip	16A		NG
1 Perimeter Gasket	By Frame Manufacturer		OT
1 Sweep	1015V		NG
1 Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1 Door Contact	Supplied By Owner		OT

Set: 5.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
3 Silencer	1229A		TC

Set: 6.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Surf Overhead Stop	9024RA	US32D	AH
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Gasketing	700SA		NG

Set: 7.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
1 Gasketing	700SA		NG

Set: 8.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Surf Overhead Stop	4423RA	US32D	AH
3 Silencer	1229A		TC

Set: 9.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE

1 Closer, Spring Stop	UNI7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Perimeter Gasket	By Frame Manufacturer		OT

Set: 10.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
3 Silencer	1229A		TC

Set: 11.0

3 Hinge	FBB168	US26D	ST
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Closer, Spring Stop	UNI7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
1 Gasketing	700SA		NG

Set: 12.0

6 Hinge	FBB168	US26D	ST
1 Flush Bolt	1855S (top of door only)	US32D	AH
1 Storeroom Lock	9K37D 15D S3B Patented 3/4	626	BE
1 Closer, Parallel Arm	PR7500 M	689	NO
2 Kick Plate	K0050	630	TC
2 Bumper	1270WX	630	TC
2 Silencer	1229A		TC

Set: 13.0

6 Hinge	FBB168	US26D	ST
1 Flush Bolt	1855S (top of door only)	US32D	AH
1 Storeroom Lock	9K37D 15D S3B Patented 3/4	626	BE
2 Kick Plate	K0050	630	TC
2 Bumper	1270WX	630	TC

2 Silencer	1229A		TC

Set: 14.0

6 Hinge	FBB168	US26D	ST
1 Flush Bolt	1855S (top of door only)	US32D	AH
1 Storeroom Lock	9K37D 15D S3B Patented 3/4	626	BE
2 Bumper	1270WX	630	TC
2 Silencer	1229A		TC

Set: 15.0

1 Hinge, Electric	FBB168 -12C	US26D	ST
2 Hinge	FBB168	US26D	ST
1 Electrified Cylindrical Lock	9KW37DEU 15D S3B Patented RQE C	626	BE
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
3 Silencer	1229A		TC
1 Door Contact	Supplied By Owner		OT
1 Reader	Supplied Under Division 28		OT
1 Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the lock shall release for 5 seconds allowing entry. After 5 seconds the lock will return to the secure state.
The built-in request to exit switch allows for unalarmed, free egress at all times.
Fail secure

Set: 16.0

1 Hinge, Electric	FBB168 -12C	US26D	ST
2 Hinge	FBB168	US26D	ST
1 Electrified Cylindrical Lock	9KW37DEU 15D S3B Patented RQE C	626	BE
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC

1 Gasketing	155V		NG
1 Door Bottom	420NA- 36" (Half Mortise)		NG
1 Door Contact	Supplied By Owner		OT
1 Reader	Supplied Under Division 28		OT
1 Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the lock shall release for 5 seconds allowing entry. After 5 seconds the lock will return to the secure state.
The built-in request to exit switch allows for unalarmed, free egress at all times.
Fail secure

Set: 17.0

1 Hinge, Electric	FBB168 -12C	US26D	ST
2 Hinge	FBB168	US26D	ST
1 Electrified Cylindrical Lock	9KW37DEU 15D S3B Patented RQE C	626	BE
1 Closer, Parallel Arm	PR7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
1 Perimeter Gasket	By Frame Manufacturer		OT
1 Door Bottom	420NA- 36" (Half Mortise)		NG
1 Door Contact	Supplied By Owner		OT
1 Reader	Supplied Under Division 28		OT
1 Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the lock shall release for 5 seconds allowing entry. After 5 seconds the lock will return to the secure state.
The built-in request to exit switch allows for unalarmed, free egress at all times.
Fail secure

Set: 18.0

2 Hinge, Electric	FBB168 -12C	US26D	ST

1	Hinge	FBB168	US26D	ST
1	Electrified Cylindrical Lock	9KW37DEU 15D S3B Patented RQE C	626	BE
1	Conc Overhead Stop	1023SL	US32D	AH
1	Closer, Regular Arm	R 7500 M	689	NO
1	Kick Plate	K0050	630	TC
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Door Contact	Supplied By Owner		OT
1	Reader	Supplied Under Division 28		OT
1	Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the lock shall release for 5 seconds allowing entry. After 5 seconds the lock will return to the secure state.
The built-in request to exit switch allows for unalarmed, free egress at all times.
Fail secure

Set: 19.0

1	Continuous Hinge, Electric	A160HD EA12-EZ	C	AH
1	Rim Exit, Nightlatch	RXLC LD 33A L 360L(09) 06	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Electric Strike	4800F	US32D	TR
1	Door Pull	RM7220 13.5" Less Door Height Mtg-Type 12HD	US32D	RO
1	Conc Overhead Stop	1023SL	US32D	AH
1	Surface Closer	PR9500	689	NO
1	Drip Strip	16A		NG
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Sweep	1015V		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Door Contact	Supplied By Owner		OT
1	Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
Door can be programmed to lock and unlock as required
The request to exit switch in the exit device allows for unalarmed free egress at all

times.
Fail secure.

Set: 20.0

3	Hinge	FBB168	US26D	ST
1	Classroom Lock	9K37R 15D S3B Patented	626	BE
1	Surf Overhead Stop	4423RA	US32D	AH
3	Silencer	1229A		TC

Set: 21.0

3	Hinge	FBB168	US26D	ST
1	Dormitory Lock w/indicators	45H7T 15H Patented VIB	626	BE
1	Surf Overhead Stop	9024RA	US32D	AH
1	Kick Plate	K0050	630	TC
1	Gasketing	700SA		NG

Set: 22.0

3	Hinge	FBB168	US26D	ST
1	Dormitory Lock w/indicators	45H7T 15H Patented VIB	626	BE
1	Kick Plate	K0050	630	TC
1	Bumper	1270WX	630	TC
1	Gasketing	155V		NG

Set: 23.0

1	Continuous Hinge	A240HD	C	AH
1	Fire Rated Rim Exit, Nightlatch	98 LNL F 996L-NL 06	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Closer, Parallel Arm	PR7500 M	689	NO
1	Kick Plate	K0050	630	TC
1	Bumper	1270WX	630	TC
1	Gasketing	700SA		NG

Set: 24.0

1 Continuous Hinge	A240HD	C	AH
1 Fire Rated Rim Exit, Passage	98 LBE F 996L-BE 06	626	VO
1 Closer, Spring Stop	UNI7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Gasketing	700SA		NG

Notes: Install gasket prior to door closer.

Set: 25.0

1 Continuous Hinge	A240HD	C	AH
1 Fire Rated Rim Exit, Passage	98 LBE F 996L-BE 06	626	VO
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
1 Gasketing	700SA		NG

Set: 26.0

1 Continuous Hinge	A240HD	C	AH
1 Fire Rated Rim Exit, Passage	98 LBE F 996L-BE 06	626	VO
1 Closer, Regular Arm	R 7500 M	689	NO
1 Kick Plate	K0050	630	TC
1 Bumper	1270WX	630	TC
1 Gasketing	700SA		NG
1 Door Bottom	420NA- 36" (Half Mortise)		NG

Set: 27.0

1 Continuous Hinge	A160HD	C	AH
1 Fire Rated Rim Exit, Passage	33A LBE F 360L-BE 06	626	VO
1 Closer, Regular Arm	R 7500 M	689	NO
1 Bumper	1270WX	630	TC
1 Gasketing	700SA		NG

Set: 28.0

1 Continuous Hinge	A110HD 083 EA12-EZ	C	AH

1	Rim Exit, Nightlatch	RXLC LD 98 LNL 996L-NL 06 CON	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Electric Strike	4800F	US32D	TR
1	Closer, Spring Stop	UNI9500 M	689	NO
1	Gasketing	700SA		NG
1	Drip Strip	16A		NG
1	Sweep	1015V		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Door Contact	Supplied By Owner		OT
1	Reader	Supplied Under Division 28		OT
1	Power Supply	By Access Control Panel Supplied by Owner		OT
1	Protector Bar	R116EDPL	US32D	RO

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the electric strike shall release for 5 seconds allowing entry. After 5 seconds the electric strike will return to the secure state.
Free egress at all times.
Fail secure

Set: 29.0

3	Hinge	FBB168	US26D	ST
1	Dormitory Lock	9K37T 15D S3B Patented	626	BE
1	Bumper	1270WX	630	TC
1	Gasketing	155V		NG

Set: 30.0

3	Hinge	FBB168	US26D	ST
1	Dormitory Lock	9K37T 15D S3B Patented	626	BE
1	Bumper	1270WX	630	TC
1	Perimeter Gasket	By Frame Manufacturer		OT

Set: 31.0

3	Hinge	FBB168	US26D	ST
1	Dormitory Lock	9K37T 15D S3B Patented	626	BE

1 Bumper	1270WX	630	TC
1 Perimeter Gasket	By Frame Manufacturer		OT
1 Door Bottom	420NA- 36" (Half Mortise)		NG

Set: 32.0

3 Hinge	FBB168	US26D	ST
1 Dormitory Lock	9K37T 15D S3B Patented	626	BE
1 Closer, Spring Stop	UNI7500 M	689	NO
1 Perimeter Gasket	By Frame Manufacturer		OT
1 Door Bottom	420NA- 36" (Half Mortise)		NG

Set: 33.0

3 Hinge	FBB168	US26D	ST
1 Dormitory Lock	9K37T 15D S3B Patented	626	BE
1 Closer, Parallel Arm	PR7500 M	689	NO
1 Bumper	1270WX	630	TC
1 Perimeter Gasket	By Frame Manufacturer		OT

Set: 34.0

3 Hinge	FBB168	US26D	ST
1 Dormitory Lock	9K37T 15D S3B Patented	626	BE
1 Bumper	1270WX	630	TC
1 STC Seal Set	By Door Manufacturer		OT

Set: 35.0

3 Hinge	FBB168	US26D	ST
1 Dormitory Lock	9K37T 15D S3B Patented	626	BE
1 Conc Overhead Stop	1023SL	US32D	AH
1 Closer, Regular Arm	R 7500 M	689	NO
1 Perimeter Gasket	By Frame Manufacturer		OT

Set: 36.0

3 Hinge	FBB168	US26D	ST

1	Mortise Deadlock	48H7R Patented	626	BE
1	Door Pull	18111	US32D	AH
1	Closer, Parallel Arm	PR7500 M	689	NO
1	Kick Plate	K0050	630	TC
1	Bumper	1270WX	630	TC
3	Silencer	1229A		TC

Set: 37.0

1	Continuous Hinge, Electric	A160HD EA12-EZ	C	AH
1	Rim Exit, Nightlatch	RXLC LD 33A L 360L(09) 06	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Electric Strike	4800F	US32D	TR
1	Conc Overhead Stop	1023SL	US32D	AH
1	Door Operator	Supplied under Section 08 71 13		BM
1	Drip Strip	16A		NG
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Sweep	1015V		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Reader	Supplied Under Division 28		OT
1	Door Contact	Supplied By Owner		OT
2	Actuator	Supplied under Section 08 71 13		BM
1	Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times.
Door can be programmed to lock and unlock as required
Entry allowed through the access control system.
Upon valid credentials or remote release the electric strike shall release for 5 seconds and the actuator on the secure side will be turned on allowing use of the operator.
After 5 seconds the electric strike shall return to the secure state and the secure side actuator switch will be turned off..
Remote access is allowed through access control system or door release.
Actuator on the non-secure side will be active at all times
The request to exit switch in the exit device allows for unalarmed free egress at all times.
upon power failure the door shall remain secure, (fail secure).

Set: 38.0

2	Continuous Hinge, Electric	A160HD EA12-EZ	C	AH
1	Rim Exit, Nightlatch	RXLC LD 33A NLOP CON 388	626	VO
1	Rim Exit, Exit Only	RXLC LD 33A EO CON	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
2	Electric Strike	4800F	US32D	TR
2	Door Pull	RM7220 13.5" Less Door Height Mtg-Type 12HD	US32D	RO
2	Conc Overhead Stop	1023SL	US32D	AH
1	Surface Closer	PR9500	689	NO
1	Door Operator	Supplied under Section 08 71 13		BM
1	Drip Strip	16A		NG
2	Perimeter Gasket	By Frame Manufacturer		OT
2	Sweep	1015V		NG
2	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
2	Door Contact	Supplied By Owner		OT
1	Reader	Supplied Under Division 28		OT
2	Actuator	Supplied under Section 08 71 13		BM
1	Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times.
Door can be programmed to lock and unlock as required
Entry allowed through the access control system.
Upon valid credentials or remote release the electric strike shall release for 5 seconds and the actuator on the secure side will be turned on allowing use of the operator.
After 5 seconds the electric strike shall return to the secure state and the secure side actuator switch will be turned off..
Remote access is allowed through access control system or door release.
Actuator on the non-secure side will be active at all times
The request to exit switch in the exit device allows for unalarmed free egress at all times.
Upon power failure the door shall remain secure, (fail secure).

Set: 39.0

2	Continuous Hinge, Electric	A160HD EA12-EZ	C	AH
2	Rim Exit, Exit Only	RXLC LD 33A EO CON	626	VO
2	Electric Strike	4800F	US32D	TR
2	Door Pull	RM7220 13.5" Less Door Height Mtg-Type 12HD	US32D	RO

2 Conc Overhead Stop	1023SL	US32D	AH
2 Surface Closer	PR9500	689	NO
1 Drip Strip	16A		NG
2 Perimeter Gasket	By Frame Manufacturer		OT
2 Sweep	1015V		NG
2 Threshold	8433N 1/4-20 SSMS/EA SIA		NG
2 Door Contact	Supplied By Owner		OT
1 Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times.
Door can be programmed to lock and unlock as required
The request to exit switch in the exit device allows for unalarmed free egress at all times.
Upon power failure the door shall remain secure, (fail secure).

Set: 40.0

2 Continuous Hinge	A160HD	C	AH
2 Door Pull	RM7220 13.5" less door Height Mtg-Type 5HD	US32D	RO
2 Conc Overhead Stop	1023SL	US32D	AH
1 Surface Closer	PR9500	689	NO
1 Door Operator	Supplied under Section 08 71 13		BM
2 Actuator	Supplied under Section 08 71 13		BM

Set: 41.0

2 Continuous Hinge	A160HD	C	AH
2 Door Pull	RM7220 13.5" less door Height Mtg-Type 5HD	US32D	RO
2 Conc Overhead Stop	1023SL	US32D	AH
2 Surface Closer	PR9500	689	NO

Set: 42.0

2 Continuous Hinge	A240HD	C	AH
2 SVR Exit, Passage	9827 LBE LBR 996L-BE 06	626	VO
2 Conc Overhead Hold Open	1013SA	US32D	AH

2	Closer, Parallel Arm	PR7500 M	689	NO
2	Kick Plate	K0050	630	TC
1	Astragal	A605A(SET)		NG
1	Perimeter Gasket	By Frame Manufacturer		OT

Set: 43.0

1	Continuous Hinge	A160HD	C	AH
1	Narrow Classroom Lock	1745 20L 2R	US32D	AC
1	Mortise Cylinder	1E-74 Patented	626	BE
1	Closer, Spring Stop	UNI9500 M	689	NO
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Sweep	1015V		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Door Contact	Supplied By Owner		OT
1	Request to Exit	Supplied under Division 28		OT

Set: 44.0

1	Continuous Hinge	A160HD	C	AH
2	Door Pull	RM7220 13.5" less door Height Mtg-Type 5HD	US32D	RO
1	Door Operator	Supplied under Section 08 71 13		BM
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Actuator	Supplied under Section 08 71 13		BM

Set: 45.0

1	Continuous Hinge	A160HD	C	AH
1	Narrow Classroom Lock	1745 20L 2R	US32D	AC
1	Mortise Cylinder	1E-74 Patented	626	BE
1	Closer, Parallel Arm	PR7500 M	689	NO
1	Bumper	1270WX	630	TC
1	Drip Strip	16A		NG
1	Perimeter Gasket	By Frame Manufacturer		OT
1	Sweep	1015V		NG
1	Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1	Door Contact	Supplied By Owner		OT

1 Request to Exit	Supplied under Division 28		OT

Set: 46.0

2 Continuous Hinge	A240HD	C	AH
1 SVR Nightlatch	CD 9827 LNL LBR 996L-NL 06	626	VO
1 SVR Dummy	CD 9827 LDT LBR 996L-DT 06	626	VO
1 Rim Cylinder	12E-72 Patented	626	BE
2 Conc Overhead Hold Open	1013A	US32D	AH
2 Surface Closer	PR9500	689	NO
1 Astragal	A605A(SET)		NG
1 Gasketing	700SA		NG

Set: 47.0

2 Continuous Hinge	A160HD	C	AH
2 Fire Rated SVR Exit, Passage	3327A LBE F LBR 360L-BE 06	626	VO
1 Closer, Parallel Arm	PR7500 M	689	NO
1 Closer, Spring Stop	UNI7500 M	689	NO
1 Bumper	1270WX	630	TC
1 Astragal	A605A(SET)		NG
1 Gasketing	700SA		NG

Set: 48.0

1 Continuous Hinge	A240HD	C	AH
1 Storeroom Lock	9K37D 15D S3B Patented	626	BE
1 Closer, Spring Stop	UNI9500 M	689	NO
1 Gasketing	700SA		NG
1 Drip Strip	16A		NG
1 Sweep	1015V		NG
1 Threshold	8433N 1/4-20 SSMS/EA SIA		NG
1 Door Contact	Supplied By Owner		OT
1 Request to Exit	Supplied under Division 28		OT

Set: 49.0

1 Continuous Hinge	A240HD EA12-EZ	C	AH

1	Rim Exit, Nightlatch	RXLC LD 98 LNL 996L-NL 06 CON	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Electric Strike	4800F	US32D	TR
1	Closer, Parallel Arm	PR7500 M	689	NO
1	Kick Plate	K0050	630	TC
1	Bumper	1270WX	630	TC
1	Gasketing	700SA		NG
1	Door Bottom	320S- 36"		NG
1	Door Contact	Supplied By Owner		OT
1	Reader	Supplied Under Division 28		OT
1	Power Supply	By Access Control Panel Supplied by Owner		OT

Notes: Theory of operation:
Door to be closed and locked at all times
entry allowed through access control system or mechanical key override.
When valid credentials are presented the electric strike shall release for 5 seconds allowing entry. After 5 seconds the electric strike will return to the secure state.
The request to exit switch in the exit device allows for unalarmed free egress at all times.
upon power failure the door shall remain secure, (fail secure).

Set: 50.0

1	Continuous Hinge	A240HD	C	AH
1	Fire Rated Rim Exit, Nightlatch	98 LNL F 996L-NL 06	626	VO
1	Rim Cylinder	12E-72 Patented	626	BE
1	Closer, Parallel Arm	PR7500 M	689	NO
1	Kick Plate	K0050	630	TC
1	Bumper	1270WX	630	TC
1	Gasketing	700SA		NG
1	Door Bottom	320S- 36"		NG

Set: 51.0

3	Hinge	FBB168	US26D	ST
1	Classroom Lock	9K37R 15D S3B Patented	626	BE
1	Bumper	1270WX	630	TC
3	Silencer	1229A		TC

Set: 52.0

1	Rim Cylinder	12E-72 Patented	626	BE

Notes: Verify cylinder type with door manufacturer

Set: 53.0

1	Electromagnetic Holder	2300	US28	AH

Notes: Balance of hardware by the gate manufacturer.

Set: 54.0

2	Continuous Hinge	A240HD	C	AH
2	SVR Exit, Exit Only	CD 9827 EO LBR SNB	626	VO
2	Door Pull	RM4190 18” less door height Sanded White Oak (Unfinished) Type 12HD mtg	US32D	RO
2	Conc Overhead Hold Open	1013A	US32D	AH
2	Surface Closer	PR9500	689	NO
1	Astragal	A605A(SET)		NG
1	Gasketing	700SA		NG

END OF SECTION

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SECTION 08 71 13 – AUTOMATIC DOOR OPERATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following types of automatic door operators:
   1. Low-energy door operators for swinging doors.

B. Related Sections:
   1. Division 7 Sections for caulking to the extent not specified in this section.
   2. Division 8 Section “Aluminum-Framed Entrances and Storefronts” for entrances furnished separately in Division 8 Section.
   3. Division 8 Section “Sliding Automatic Entrances” for single and bi-parting sliding automatic entrance doors with sidelites.
   4. Division 8 Section “Door Hardware” for hardware to the extent not specified in this Section.
   5. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance door operators and access control devices.

1.3 REFERENCES

A. References: Comply with the version year adopted by the Authority Having Jurisdiction.
   1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
   2. ICC/IBC - International Building Code.
   3. CUL – Approved for use in Canada.
   4. NFPA 70 - National Electrical Code.
   5. NFPA 80 - Fire Doors and Windows.
   6. NFPA 101 - Life Safety Code.
   7. NFPA 105 - Installation of Smoke Door Assemblies.

B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).
   1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
   2. ANSI/BHMA A156.19 Standards for Power Assist and Low Energy Power Operated Doors.

C. Underwriters Laboratories (UL).
   1. UL Listed R-9469 Fire Door Operator with Automatic Closer.
   2. UL10C – Positive Pressure Fire Tests of Door Assemblies.

3. UL 325 - Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.
4. UL991 Listed - Tests for Safety-Related Controls Employing Solid-State Device.
5. UL244A – Solid – State Controls for Appliances.
6. UL1998 – Software in Programmable Components.
7. UL1310 – Class 2 Power Units.

D. Canadian Standards Association (CSA).
1. CAN/CSA-C22.2 NO 223-M91 – Power Supplies With Extra-Low-Voltage Class 2 Outputs.
2. CAN/CSA-C22.2 NO 223-M92 – Operators and Systems of Doors, Gates, Draperies, and Louvers.

E. American Association of Automatic Door Manufacturers (AAADM).

F. American Society for Testing and Materials (ASTM).
1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

G. American Architectural Manufacturers Association (AAMA).
1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

H. National Association of Architectural Metal Manufacturers (NAAMM).
1. Metal Finishes Manual for Architectural Metal Products.

I. International Code Council (ICC).
1. IBC: International Building Code Building Code.
2. CBC: California Building Code.

1.4 DEFINITIONS

A. Double Egress Doors: A pair of doors that swing with the two doors moving in opposite directions with no mullion between them.

B. Double Swing Doors: A pair of doors that swing with the two doors moving in opposite directions with a mullion between them; each door functioning as a single swing door.

C. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to activate the operation of the door.
1. Knowing act: Consciously initiating the powered opening of a low energy door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.

D. Safety Device: A device that detects the presence of an object or person within a zone where contact could occur and provides a signal to stop the movement of the door.

E. AAADM: American Association of Automatic Door Manufacturers.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide automatic door operators that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.

B. Automatic door equipment accommodates medium to heavy pedestrian traffic and have the following minimum performance characteristics:
   1. Up to 700 pound (317.5 kg) weight of doors, 48 inches (1219 mm) maximum door width per operator.

C. Operator capable of operating within temperature ranges of -31° F to 160° F (-35° C to 71° C).

D. Opening Force requirements: Doors shall open with a manual force, not to exceed 30lbf (133N) to set the door in motion and 15 lbf to fully open the door applied at 1" (25 mm) from the latch edge of the door. The force required to prevent a stopped door from opening or closing shall not exceed 15 lbf (67 N) measured 1" (25 mm) from the latch edge of the door at any point during opening or closing.

E. Break Away Device: Swinging automatic entrances shall require no more than 50 lbf (222 N) applied 1" (25 mm) from the latch edge of the door. When the door(s) is opened in the breakout mode, powered operated components excluding spring power shall not operate the doors.

F. Closing Time:
   1. Doors shall be field adjustable to close from 90 degrees to 10 degrees in 3 seconds or longer as applicable per ANSI/BHMA A156.19 standards.
   2. Doors shall be field adjusted to close from 10 degrees to fully closed in not less than 1.5 seconds.

1.6 SUBMITTALS

A. Comply with Division 01 - Submittal Procedures.

B. Product Data: Manufacturer's product sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.

C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections and details, indicating dimensions, materials, operator, motion/presence sensor control device, anchors, hardware, finish, options and accessories.
   1. Indicate required clearances, and location and size of each field connection.
   2. Indicate locations and elevations of entrances showing activation and safety devices.
   3. Wiring Diagrams: For power, signal, and activation / safety device wiring.

D. Samples: Submit manufacturer's samples of aluminum finish.

E. Manufacturers Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.19 after completion of installation.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door opening installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.

G. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.7 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance.
   1. A manufacturer with company certificate issued by AAADM.

B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 5 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Certified Inspector Qualifications: Certified by AAADM.

D. Source Limitations for Automatic Operators: Obtain each type of door operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.

E. Certifications: Operators shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards.
   1. ANSI/BHMA A156.19 American National Standard for Power Assist and Low Energy Operated Doors.
   2. NFPA 101 - Life Safety Code.
   3. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
   4. UL Listed R-9469 Fire Door Operator with Automatic Closer.

F. Emergency Exit door requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.8 COORDINATION

A. Coordinate door operators with doors, frames and related work to ensure proper size, thickness, hand, function and finish. Coordinate hardware for automatic entrances with hardware required for rest of the project.

B. Electrical System Roughing-in: Coordinate layout and installation of power door operators with connections to power supplies and access control system as applicable.

1.9 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Automatic Door Operators shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

C. During the warranty period a factory-trained technician shall perform service and affect repairs. An inspection shall be performed after each adjustment or repair.

D. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.

E. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer:
1. ASSA ABLOY Entrance Systems
2. Horton
3. Stanley

2.2 AUTOMATIC SWING DOOR OPERATOR

A. Model: Besam SW200i low energy automatic door operator (Basis of Design):
1. Configuration: Operator to control single swinging doors and pairs of swinging doors as indicated on the drawings and specified below:
   a. Traffic Pattern: **Two way.**
   b. Pairs of Doors: **Simultaneous swing**
2. Automatic Operator**:** Electro-mechanical, non-handed operator, powered by 24 volt, 1/4 hp motor. Operator shall be adjustable to compensate for different manual push forces as required.
   a. Automatic operator shall be capable of operating and controlling up to a 700 pound (317.5 kg) door, 48 inches (1219 mm) in width.

b. [Surface Mounted Operator:]
1) Surface Mounted Housing: Continuous for full width of door.
2) Connecting Hardware: Surface mounted operators to have a steel arm from the operator, mounted to the top face of the swing door.
3) UL Listed R-9469 Fire Door Operator with Automatic Closer (surface mounted operator).

NOTE: Select the following Overhead Concealed Operator for doors that are either offset pivoted or hinged

NOTE: Emergency breakaway is not available with offset pivoted or hinged doors

c. Operator can be field upgraded to a full energy operator by the addition of the required safety sensors, and guard rails to comply with ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
d. Electrical Characteristics: Maximum power consumption is 300 watts (2.5 amps at 120 VAC), 50/60hz, built-in thermal overload protection.

3. Door Operation:
a. Opening Cycle The adjustable speed operator mechanically powers the drive shaft and the torque control maintains constant speed throughout the opening cycle regardless of stack pressures or wind speed. Operator shall allow manual door operation with operational forces as indicated to fully open the door applied at 1” (25 mm) from the latch edge of the door.
1) Manual push force shall be adjustable from 5 lbf to 15 lbf maximum.
b. Hold Open: The operator shall stop and hold the door open at the selected door opening angle for an adjustable period of time (1.5 seconds to 30 seconds).
c. Closing Cycle: Spring close with speed controlled power assist.
1) Upon loss of power, dynamic braking will control the door insuring controlled closing.
2) Selectable Torque Control: Automatically adjusts torque without changing the closing speed of the operator.
a) When the torque control is activated, the closing speed shall remain constant regardless of stack pressures or wind speed.
b) Torque Cancellation: The torque control is deactivated whenever there is a signal received from door mounted sensors.
c) The torque control is disabled during manual use of the door.
d. Wind Force Dampening: The operator electromechanically counteracts wind forces, slowing down the door movement to safely open or close the door.
e. Stack Pressure Compensation: Operator shall counteract positive stack pressures, negative stack pressures, and sudden changes of stack pressures. The operator never allows the door to open or close faster than the speed control settings, regardless of pressures.
f. Obstruction Control: The operator will stop and reverse the door movement.
g. Electric Lock Management:
1) Internal module for electrified locking integration.
2) Electric Lock Output: Selectable 12 VDC, maximum 1200 mA / 24 VDC, maximum 600 mA.

3) Lock monitoring prevents operator(s) from opening door(s) until release of electrified lock.
4) Operator pulls door closed before opening, automatically unjamming electric latch hardware.
5) Sequenced operation between operators for pairs of doors allowing lock release and astragal coordination.

h. Lock Retry Circuit: If attempt to fully close the door is unsuccessful, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully close the door.

i. Selectable Alarm Reset: The operator can be field set so that after receiving an alarm signal, the operator will not accept any activation impulses and will operate only as a manual door closer until manually reset.

j. Electronic Controls: Solid state integrated circuit controls the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. The controls include time delay (1 to 30 seconds) for normal cycle.

k. Control Switch: Automatic door operators shall be equipped with the following type of multi-position function switch:

1) [3 position rocker switch mounted on end cap (On-Auto-Hold).]

4. Operator Interface:

a. Safety Sensor Integration for overhead presence safety device and door mounted reactivation safety sensors.

2.3 ACTIVATION AND SAFETY DEVICES

A. General: Provide activation and safety devices in accordance with ANSI/BHMA standards, for condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.

B. Knowing Act Activation Device:

1. **[Sensor Plate: Touchless, [2-3/4 inch x 4-1/2 inch] or [4-1/2-inch square] activation senor plates, black polycarbonate with white letters. Microwave technology has an adjustable range of 2 inches to 24 inches.]**

2.4 ALUMINUM FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Automatic Operator Enclosure:

1. **Anodized Finish:**

a. **[AAMA 611, Clear, AA- M12C22A41, Class I, 0.018 mm.]**

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical source power to verify actual locations of wiring connections.

C. Proceed only after such discrepancies or conflicts have been resolved.

3.2 INSTALLATION

A. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.

B. Operators: Install automatic operators plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
   1. Install surface mounted hardware using concealed fasteners to greatest extent possible.
   2. Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.

C. Sealants: Comply with requirements specified in division 7 Section “Joint Sealants” to seal between the operator housing and the adjacent wall surface.

D. Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.19 and manufacturers installation instructions.

3.3 FIELD QUALITY CONTROL

A. Manufacturers Field Services:
   1. Manufacturer’s representative shall provide technical assistance and guidance for installation of doors.
   2. Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.19. Certified technician shall be approved by manufacturer.

3.4 ADJUSTING

A. Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.19.

3.5 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by automatic operator installation.

B. Clean metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.

3.6 DEMONSTRATION

A. Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

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SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Glass products.
   2. Laminated glass.
   3. Insulating glass.
   4. Glazing sealants.
   5. Glazing tapes.
   6. Miscellaneous glazing materials.

1.2 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

C. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:
   1. Report flat glass quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in flat glass. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.
   2. Report insulated glass units quantities and submit Environmental Product Declarations (EPDs), that include the amount of embodied carbon in insulated glass units. The EPDs shall be product-specific, facility-specific and/or supply chain-specific.

C. Glass Samples: For each type of the following products; 12 inches square.
   1. Insulating glass.

D. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of adjoining framing system.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturers of fabricated glass units.

B. Product Certificates: For glass.

C. Product Test Reports: For fabricated glass, for tests performed by a qualified testing agency.
   1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.

C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
   1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.9 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
   1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Products/Manufacturers: As indicated at the end of Part 3 of this Specification Section.

B. Source Limitations for Glass: Obtain glass from single source from single manufacturer.

C. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
   1. Design Wind Pressures: As indicated on Drawings.
   2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
   3. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
   1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
   2. For laminated-glass lites, properties are based on products of construction indicated.
   3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
   4. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.
   5. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
   6. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
   2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
   1. Minimum Glass Thickness for Exterior Lites: 6 mm.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

B. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
   1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 LAMINATED GLASS

A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
   1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
   2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
   3. Interlayer Color: As indicated.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
   1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
   2. Perimeter Spacer: Thermally broken aluminum.
   3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.7 GLAZING SEALANTS

A. General:
   1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

B. Neutral-Curing Silicone Glazing Sealant, Class 100/50: Complying with ASTM C920, Type S, Grade NS, Use NT.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Type recommended in writing by sealant or glass manufacturer.

D. Spacers: Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks: Type recommended in writing by sealant or glass manufacturer.

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
   1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
      a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
   1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
   2. Presence and functioning of weep systems.
   3. Minimum required face and edge clearances.
   4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.
   1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
   2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants

cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
   1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

A. Clear Glass Type S-1: Fully tempered float glass.
   1. Minimum Thickness: 6 mm.
   2. Safety glazing required.

3.9 LAMINATED GLASS SCHEDULE

A. Clear Laminated Glass Type S-4: Two plies of annealed float glass.
   1. Minimum Thickness of Glass Ply: 3 mm.
   2. Minimum Thickness of Glass Ply: 6 mm.
   3. Interlayer Thickness: 0.030 inch.
   4. Safety glazing required.

3.10 INSULATING GLASS SCHEDULE

A. Low-E-Coated, Clear Insulating Glass Type I-1:
   1. Basis-of-Design Product: UltraClear Glass with SunGuard SNX 70+ and Guardian Bird1st Etch SqX24; Guardian Glass.
   2. Overall Unit Thickness: 1 inch.
   3. Minimum Thickness of Each Glass Lite: 6 mm.

4. Outdoor Lite: Fully tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully tempered float glass.
7. Low-E Coating: Sputtered on second surface.
8. Bird Etching on the first surface.
9. Winter Nighttime U-Factor: 0.237 maximum.
10. Summer Daytime U-Factor: 0.207 maximum.
11. Visible Light Transmittance: 68 percent minimum.
12. SHGC: 0.28 maximum.
13. Safety glazing required.

3.11 INSULATING-LAMINATED-GLASS SCHEDULE

A. Low-E-Coated, Clear Insulating Laminated Glass Type I-2:
1. Basis-of-Design Product: UltraClear Glass with SunGuard SNX 70+ and Guardian Bird1st Etch SqX24; Guardian Glass.
2. Overall Unit Thickness: 1 inch.
3. Outdoor Lite: Clear laminated glass with two plies of fully tempered float glass.
    a. Minimum Thickness of Each Glass Ply: 3 mm.
    b. Interlayer:
        1) Product/Manufacturer: Basis of design.
            a) Vanceva Color System by Saflex.
        2) Interlayer Color: As selected by Architect from manufacturer's full range. 4 different colors with be selected.
        3) Interlayer Thickness: Multiple layers of 0.060 inch interlayer to produce color selected.
4. Interspace Content: Argon.
5. Indoor Lite: 6 mm clear fully tempered float glass.
6. Low-E Coating: Sputtered on fifth surface (indoor lite surface towards air space).
7. Bird Etching on the first surface.
8. Winter Nighttime U-Factor: 0.235 maximum.
9. Summer Daytime U-Factor: 0.206 maximum.
10. Safety glazing required.

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SECTION 08 83 00 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Silvered flat glass mirrors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Mirrors: Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.

B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.

C. Samples: For each type of the following:
   1. Mirrors: 12 inches square, including edge treatment on two adjoining edges.
   2. Mirror Trim: 12 inches long.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of mirror and mirror mastic.

B. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing and substrates on which mirrors are installed.

C. Qualification Statements: For Installer.

D. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For mirrors to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Installer, who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.
   1. Testing is not required if data are submitted based on previous testing of mirror mastic products and mirror backing matching those submitted.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors in accordance with mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.

B. Source Limitations for Mirror Accessories: Obtain mirror-glazing accessories from single source.

2.2 SILVERED FLAT GLASS MIRRORS

A. Mirrors, General: ASTM C1503; manufactured using copper-free, low-lead mirror coating process.

B. Annealed Monolithic Glass Mirrors: Mirror Select Quality Q1 clear.
   1. Nominal Thickness: 6.0 mm.

C. Safety Glazing Products: For film-backed mirrors, provide products that comply with 16 CFR 1201, Category II.

2.3 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.4 MIRROR HARDWARE

A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.
   1. Aluminum J-Channel Bottom and Side Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch in height, respectively, and a thickness of not less than 0.04 inch.
   2. Aluminum J-Channel Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch in height, respectively, and a thickness of not less than 0.04 inch.
   3. Finish: Clear bright anodized.

B. Plated Steel Hardware: Formed-steel shapes with plated finish indicated.
   1. Profile: As indicated.

C. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

D. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.5 FABRICATION

A. Shop fabricate mirrors to greatest extent possible.

B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts, so they fit closely around penetrations in mirrors.

C. Mirror Edge Treatment: Rounded polished.
   1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
   2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

B. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers with mirror mastic.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced National Glass Association (NGA) publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
   1. NGA Publications: "Glazing Manual" and "Installation Techniques Designed to Prolong the Life of Flat Glass Mirrors."

B. Provide a minimum airspace of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
   1. Aluminum J-Channels: Provide setting blocks 1/8 inch thick by 4 inches long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch wide by 3/8 inch long at bottom channel.
   2. Install mastic as follows:

a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch between back of mirrors and mounting surface.

3.4 CLEANING AND PROTECTION

A. Protect mirrors from breakage and contaminating substances resulting from construction operations.

B. Do not permit edges of mirrors to be exposed to standing water.

C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

D. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer and NGA's publication "Proper Procedures for Cleaning Flat Glass Mirrors."

END OF SECTION 08 83 00

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SECTION 08 85 13 –SHADOW BOX ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal shadow box (back pans) at interior side of glass at curtain wall framing.

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal and accessory.

B. Shop Drawings:
   1. Include fabrication and installation layouts of shadow boxes, details of edge conditions, joints, profiles, corners, attachment system, and accessories.

1.3 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical shadow box assembly as shown on Drawings, including attachments, and accessories.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, shadow boxes, and other manufactured items so as not to be damaged or deformed. Package shadow boxes for protection during transportation and handling.

B. Unload, store, and erect metal shadow boxes in a manner to prevent bending, warping, twisting, and surface damage.

1.5 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace shadow boxes that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHADOW BOXES

A. Provide factory-formed shadow boxes designed to be mechanically attaching through shadow box return to supports using fasteners.

B. Shadow boxes: Formed with vertical and horizontal panel edges returned to form a pan.
   1. Aluminum Sheet: Provide facings of aluminum coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
      a. Thickness: 0.063 inch.
      b. Surface: Smooth, flat finish.
      c. Finish: Match curtain wall as specified in Section 08 44 23 – Structural-Sealant-Glazed Curtain Walls.

C. Mineral-Wool Board Insulation, Type III, Faced: ASTM C612, Type III; faced on one side with foil-scrim or foil-scrim-polyethylene vapor retarder.
   1. Nominal Density: 8 lb/cu. ft..
   2. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
   3. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.

2.2 MISCELLANEOUS MATERIALS

A. Accessories: Provide components required for a complete, shadow box assembly including trim, clips, sealants, insulation, and similar items. Match material and finish of metal unless otherwise indicated.

B. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

C. Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of shadow box panel by means of factory-applied coating.

2.3 FABRICATION

A. Fabricate and finish shadow boxes and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

2.4 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Refer to Section 08 44 23 – Structural-Sealant-Glazed Curtain Walls.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF SHADOW BOXES

A. Install metal shadow boxes according to manufacturer's written instructions in orientation, sizes, and locations indicated. Anchor shadow boxes and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Install screw fasteners in predrilled holes.

B. Fasteners:
   1. Steel Shadow Boxes: Use galvanized-steel fasteners for surfaces exposed to the interior.

3.3 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films as shadow boxes are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of s shadow box installation, clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

B. Replace shadow boxes that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 08 85 13

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SECTION 08 87 23 - ARCHITECTURAL GLASS FILM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Films applied to surface of glass.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations. Include data substantiating that products to be furnished comply with requirements of the contract documents.
   1. Manufacturer's data sheets on each product to be used, including:
      a. Preparation instructions and recommendations.
      b. Storage and handling requirements and recommendations.
      c. Installation methods.

B. Samples for Verification: 12-inch square samples of each glazing film, of each product color selected.

C. Maintenance Data: Submit manufacturer's instructions for proper maintenance materials and procedures.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain required products from a single manufacturer.
   1. Accessories: Provide accessory items only as produced or recommended by manufacturer of primary products.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
   1. Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
   2. Provide a commercial building reference list of 6 properties where the installer has applied window film. This list will include the following information:
      a. Name of building.
      b. The name and telephone number of a management contact.
      c. Type of glass.
      d. Type of film.
      e. Amount of film installed.
      f. Date of completion.
   3. Provide a Glass Stress Analysis of the glass and proposed glass/film combination as recommended by the film manufacturer.

C. Fire Performance: Surface burning characteristics when tested in accordance ASTM E 84:
   1. Flame Spread: 25, maximum.
   2. Smoke Developed: 450, maximum.

D. Mockups: Before applying glass film, provide mockup of glass film to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
   2. Obtain Architect's approval of mockups before starting fabrication.
   3. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 3M.
   2. Solyx.
   3. Llumar.

B. Product/Manufacturer: Basis of Design.
   1. As indicated on Drawings.

C. Product Description: Single or multi-layered decorative film products, applied to interior glass surfaces, consisting of from outboard surface to inboard surface:
   1. Removable release liner.
   2. Pressure sensitive adhesive with integral ultraviolet absorbers.
   3. Clear, dyed, or printed pattern layer of polyester film.

D. Colors and Transparency: As indicated on Drawings.

2.2 GLASS FILM ACCESSORIES

A. General: Provide products complying with requirements of glazing film manufacturer for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Adhesive: Pressure Sensitive acrylic adhesive system.

C. Cleaners, Primers, and Sealers: Types recommended by glazing film manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect substrates and conditions under which the work of this section will be performed, and verify that installation properly may commence. Do not proceed with the work until unsatisfactory conditions have been resolved fully.

3.2 PREPARATION

A. Clean substrate, removing projections and substances detrimental to the work; comply with recommendations of manufacturer of products to be installed for proper preparation procedures.

B. Comply with manufacturer's written instructions for surface preparation.

C. Immediately before beginning installation of films, clean glass surfaces of substances that could impair glazing film's bond, including mold, mildew, oil, grease, dirt and other foreign materials.

D. Protect window frames and surrounding conditions from damage during installation.

3.3 APPLICATION

A. General: Comply with manufacturer's instructions, except where more stringent requirements are shown or specified, and except where project conditions require extra precautions or provisions to ensure satisfactory performance of the work.
   1. Install film continuously, but not necessarily in one continuous length. Install with no gaps or overlaps.

2. If seamed, install with no gaps or overlaps. Install seams vertical and plumb. No horizontal seams allowed.
3. Do not remove release liner from film until just before each piece of film is cut and ready for installation.
4. Install film with mounting solution and custom cut to the glass with neat, square comers and edges to within 1/8 inch of the window frame.
5. Remove air bubbles, wrinkles, blisters, and other defects.

B. After installation, view film from a distance of 10 feet against a bright uniform sky or background. Film shall appear uniform in appearance with no visible streaks, banding, thin spots or pinholes.
   1. If installed film does not meet these criteria, remove and replace with new film.

3.4 CLEANING

A. Upon completion, clean all surfaces which have become soiled or coated as a result of work of this section, using proper methods which will not scratch or otherwise damage finished surfaces.
   1. For cleaning, use only products and techniques acceptable to manufacturer of products being cleaned.

END OF SECTION 08 87 23

SECTION 08 88 13 - FIRE-RATED GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire-protection-rated glazing.

1.2 DEFINITIONS

A. Fire-Protection-Rated Glazing: Glazing that prevents spread of fire and smoke and complies with requirements for rated openings; incapable of blocking radiant heat

B. Fire-Resistance-Rated Glazing: Glazing that prevents spread of fire and smoke and radiant heat and complies with requirements for rated walls and rated openings; capable of blocking radiant heat

C. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

D. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product; 12 inches square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of glass and glazing product.

B. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the NGA's Certified Glass Installer Program.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install fire-resistant glazing until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature conditions at occupancy levels during remainder of construction period.

1.9 WARRANTY

A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Glass: For each glass type, obtain from single source from single manufacturer.

B. Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; deterioration of glazing materials; or other defects in construction.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organization below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, glass thickness, and safety glazing standard with which glass complies.

2.4 GLASS PRODUCTS

A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

B. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
   1. Construction: Laminate glass with polyvinyl butyral interlayer unless fire-protection or fire-resistance rating is based on another product.
   2. Interlayer Thickness: Provide thickness as needed to comply with requirements.
   3. Interlayer Color: Clear unless otherwise indicated.

2.5 FIRE-PROTECTION-RATED GLAZING

A. General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing in accordance with NFPA 257 or UL 9, including hose-stream test, and shall comply with NFPA 80.
   1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from hose-stream test.

B. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether glazing has passed hose-stream test; whether glazing meets 450 deg F temperature-rise limitation; and fire-resistance rating in minutes.

C. Fire-Protection-Rated Laminated Ceramic Glazing: Laminated glass made from two plies of clear, ceramic glass; 8-mm total thickness; complying with 16 CFR 1201, Category II.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
      a. Schott North America, Inc.; Pyran Platinum L.

b. Technical Glass Products; FireLite Plus.
c. Vetrotech Saint-Gobain; Keralite Laminated.

2.6 GLAZING ACCESSORIES

A. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with glazing products and each other and are approved by testing agencies that listed and labeled fire-resistant glazing products with which products are used for applications and fire-protection ratings indicated.

B. Glazing Sealants for Fire-Rated Glazing Products: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated.
1. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

D. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Perimeter Insulation for Fire-Resistance-Rated Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.8 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with manufacturing and installation tolerances, including those for size, squareness, and offsets at corners, and for compliance with minimum required face and edge clearances.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate fire side and protected side. Label or mark units as needed so that fire side and protected side are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.

B. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches.
   1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
   2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

I. Set glass lites with proper orientation so that coatings face fire side or protected side as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
   1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 FIRE-PROTECTION-RATED GLAZING SCHEDULE

A. Glass Type S-2: 90-minute fire-protection-rated glazing; fire-protection-rated laminated ceramic glazing.

B. Glass Type S-3: 120-minute fire-protection-rated glazing; fire-protection-rated laminated ceramic glazing.

C. Glass Type S-5: 45-minute fire-protection-rated glazing; fire-protection-rated laminated ceramic glazing.

END OF SECTION 08 88 13

SECTION 09 05 61.13 - MOISTURE VAPOR EMISSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fluid-applied membrane-forming systems that control the moisture-vapor-emission rate of high-moisture, interior concrete to prepare it for floor covering installation.

1.2 DEFINITIONS

A. MVE: Moisture vapor emission.

B. MVER: Moisture vapor emission rate.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Product Test Reports: For each MVE-control system, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Preinstallation testing reports.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Employs factory-trained personnel who are available for consultation and Project-site inspection.
   1. Manufacturer to have ISO 9001 quality management system registration.
   2. Manufacturer to have ISO 14001 environmental management system registration.

B. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating directions for storage and mixing with other components.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Comply with MVE-control system manufacturer's written instructions for substrate and ambient temperatures, humidity, ventilation, and other conditions affecting system installation.
   1. Store system components in a temperature-controlled environment and protected from weather and at ambient temperature of not less than 65 deg F and not more than 85 deg F at least 48 hours before use.
   2. Maintain ambient temperature and relative humidity in installation areas within range recommended in writing by MVE-control system manufacturer, but not less than 65 deg F or more than 85 deg F and not less than 40 or more than 60 percent relative humidity, for 48 hours before installation, during installation, and for 48 hours after installation unless longer period is recommended in writing by manufacturer.
   3. Install MVE-control systems where concrete surface temperatures will remain a minimum of 5 deg F higher than the dew point for ambient temperature and relative humidity conditions in installation areas for 48 hours before installation, during installation, and for 48 hours after installation unless longer period is recommended in writing by manufacturer.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair coatings that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. MVE-Control System Capabilities: Capable of suppressing MVE without failure where installed on concrete that exhibits the following conditions:
   1. MVER: Maximum 25 lb of water/1000 sq. ft. when tested in accordance with ASTM F1869.
   2. Relative Humidity: Maximum 100 percent when tested in accordance with ASTM F2170 using in situ probes.

B. Water-Vapor Transmission: Through MVE-control system, maximum 0.10 perm when tested in accordance with ASTM E96/E96M.

C. Tensile Bond Strength: For MVE-control system, greater than 200 psi with failure in the concrete in accordance with ASTM D7234.

2.2 MVE-CONTROL EPOXY SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide Schönox, HPS North America, Inc.; SCHÖNOX EPA or comparable product by one of the following:
   1. ARDEX Americas.
   2. KOSTER American Corporation.

B. MVE-Control System: ASTM F3010-qualified, fluid-applied, two-component, epoxy-resin, membrane-forming system; formulated for application on concrete substrates to reduce MVER to level required for installation of floor coverings indicated and acceptable to manufacturers of floor covering products indicated, including adhesives.
   1. Substrate Primer: Provide MVE-control system manufacturer's concrete-substrate primer if required for system indicated by substrate conditions.
   2. Cementitious Underlayment Primer: If required for subsequent installation of cementitious underlayment products, provide MVE-control system manufacturer's primer to ensure adhesion of products to MVE-control system.
   3. VOC Content: Provide coating with VOC content of 100 g/L or less.

2.3 ACCESSORIES

A. Patching and Leveling Material: Moisture-, mildew-, and alkali-resistant product recommended in writing by MVE-control system manufacturer and with minimum of 3700-psi compressive strength after 28 days when tested in accordance with ASTM C109/C109M.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Schönox, HPS North America, Inc.; SCHÖNOX PL or comparable product.

B. Crack-Filling Material: Material recommended in writing by MVE-control system manufacturer for concrete substrate crack repair.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Schönox, HPS North America, Inc.; SCHÖNOX SGH or comparable product.

C. Hydraulic Cement Underlayment: Provide MVE-control system manufacturer's hydraulic cement-based underlayment.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Schönox, HPS North America, Inc.; SCHÖNOX ZM or comparable product.

EXECUTION

2.4 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Installation of system indicates acceptance of surfaces and conditions.

2.5 PREPARATION

A. Preinstallation Testing:
   1. Testing Agency: Engage a qualified testing agency to perform tests.
   2. Alkalinity Testing: Perform pH testing in accordance with ASTM F710. Install MVE-control system in areas where pH readings are less than 7.0 and in areas where pH readings are greater than 8.5.
   3. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Anhydrous Calcium Chloride Test: ASTM F1869. Install MVE-control system in locations where concrete substrate MVER exceeds 3 lb of water/1000 sq. ft. in 24 hours.
      b. Internal Relative Humidity Test: Using in situ probes, ASTM F2170. Install MVE-control system in locations where concrete substrates exhibit relative humidity level greater than 75 percent.
   4. Tensile-Bond-Strength Testing: For typical locations indicated to receive installation of MVE-control system, install minimum 100-sq. ft. area of MVE-control system to prepared concrete substrate and test in accordance with ASTM D7234.
      a. Proceed with installation only where tensile bond strength is greater than 200 psi with failure in the concrete.

B. Concrete Substrates: Prepare and clean substrates in accordance with MVE-control system manufacturer's written instructions to ensure adhesion of system to concrete.
   1. Remove coatings and other substances that are incompatible with MVE-control system and that contain soap, wax, oil, or silicone, using mechanical methods recommended in writing by MVE-control system manufacturer. Do not use solvents.
   2. Provide concrete surface profile complying with ICRI 310.2R CSP 3 by shot blasting using apparatus that abrades the concrete surface with shot, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
   3. After shot blasting, repair damaged and deteriorated concrete in accordance with MVE-control system manufacturer's written instructions.
   4. Protect substrate voids and joints to prevent resins from flowing into or leaking through them.
   5. Fill surface depressions and irregularities with patching and leveling material.
   6. Fill surface cracks, grooves, control joints, and other nonmoving joints with crack-filling material.
   7. Allow concrete to dry, undisturbed, for period recommended in writing by MVE-control system manufacturer after surface preparation, but not less than 24 hours.
   8. Before installing MVE-control systems, broom sweep and vacuum prepared concrete.

C. Protect walls, floor openings, electrical openings, door frames, and other obstructions during installation.

2.6 INSTALLATION

A. Install MVE-control system in accordance with ASTM F3010 and manufacturer's written instructions to produce a uniform, monolithic surface free of surface deficiencies such as pin holes, fish eyes, and voids.
   1. Install primers as required to comply with manufacturer's written instructions.

B. Do not apply MVE-control system across substrate expansion, isolation, and other moving joints.

C. Apply system, including component coats if any, in thickness recommended in writing by MVE-control system manufacturer for MVER indicated by preinstallation testing.

D. Cure MVE-control system components in accordance with manufacturer's written instructions. Prevent contamination or other damage during installation and curing processes.

E. After curing, examine MVE-control system for surface deficiencies. Repair surface deficiencies in accordance with manufacturer's written instructions.

F. Install cementitious underlayment over cured membrane if required to maintain manufacturer's warranty and in thickness required to maintain the warranty.

2.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform installation inspections.

B. Installation Inspections: Inspect substrate preparation and installation of system components to ensure compliance with manufacturer's written instructions and to ensure that a complete MVE-control system is installed without deficiencies.
   1. Verify that surface preparation meets requirements.
   2. Verify that component coats and complete MVE-control-system film thicknesses comply with manufacturer's written instructions.
   3. Verify that MVE-control-system components and installation areas that evidence deficiencies are repaired in accordance with manufacturer's written instructions.

C. MVE-control system will be considered defective if it does not pass inspections.

2.8 PROTECTION

A. Protect MVE-control system from damage, wear, dirt, dust, and other contaminants before floor covering installation. Use protective methods and materials, including temporary coverings, recommended in writing by MVE-control system manufacturer.

B. Do not allow subsequent preinstallation examination and testing for floor covering installation to damage, puncture, or otherwise compromise the MVE-control system membrane.

MOISTURE VAPOR EMISSION CONTROL

END OF SECTION 09 05 61.13

SECTION 09 21 16.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Gypsum board shaft wall assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assembly.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and support them on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.

B. Do not install finish panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E90 and classified according to ASTM E413 by a testing and inspecting agency.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

A. Fire-Resistance Rating: As indicated on Drawings.

B. STC Rating: As indicated on Drawings.

C. Gypsum Shaftliner Board:
1. Type X: ASTM C1396/C1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, 1 inch thick, with double beveled long edges.
2. Moisture- and Mold-Resistant Type X: ASTM C1396/C1396M; manufacturer's proprietary fire-resistive liner panels with ASTM D3273 mold-resistance score of 10 as rated according to ASTM D3274, 1 inch thick, and with double beveled long edges.

D. Non-Load-Bearing Steel Framing, General: Complying with ASTM C645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.
1. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized unless otherwise indicated.

E. Studs: Manufacturer's standard profile for repetitive, corner, and end members as follows:
1. Depth: As indicated.
2. Minimum Base-Metal Thickness: 0.033 inch.

F. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches long and matching studs in depth.
1. Minimum Base-Metal Thickness: Matching steel studs 0.033 inch.

G. Finish Panels: Gypsum board as specified in Section 09 29 00 "Gypsum Board.".

H. Sound Attenuation Blankets: As specified in Section 09 29 00 "Gypsum Board."

2.3 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.

B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 09 29 00 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.

2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

E. Reinforcing: Galvanized-steel reinforcing strips with 0.033-inch minimum thickness of base metal (uncoated).

F. Acoustical Sealant: Section 07 92 19 "Acoustical Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft wall assemblies so both elements of Work remain complete and undamaged. Patch or replace sprayed fire-resistive materials removed or damaged during installation of shaft wall assemblies to comply with requirements specified in Section 07 81 00 "Applied Fire Protection."

B. After sprayed fire-resistive materials are applied, remove only to extent necessary for installation of gypsum board shaft wall assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION

A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.

B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
   1. Reinforcing: Provide where items attach directly to shaft wall assembly as indicated on Drawings; accurately position and secure behind at least one layer of face panel.

D. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons and floor indicators, and similar items.

E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.

F. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.

G. Shaft Wall Assemblies: Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.

H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.4 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, or mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16.23

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Non-load-bearing steel framing systems for interior partitions.
   2. Suspension systems for interior ceilings and soffits.
   3. Grid suspension systems for gypsum board ceilings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Notify manufacturer of damaged materials received prior to installation.

B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with AISI S220 for conditions indicated.
   1. Steel Sheet Components: Comply with AISI S220 requirements for metal unless otherwise indicated
   2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.

B. Studs and Track: AISI S220.
   1. Minimum Base-Steel Thickness: 0.0296 inch.

C. Slip-Type Head Joints: Where indicated, provide[**one of**] the following:
   1. Single Long-Leg Track System: ASTM C645 top track with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
   1. Minimum Base-Steel Thickness: 0.042 inch.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.
   1. Depth: 1-1/2 inches.
   2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.

F. Hat-Shaped, Rigid Furring Channels: ASTM C645.
   1. Minimum Base-Steel Thickness: 0.0296 inch.
   2. Depth: 7/8 inch.

G. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
   1. Configuration: Asymmetrical.

2.3 SUSPENSION SYSTEMS

A. Hanger Attachments to Concrete:
   1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC58 or AC308 as appropriate for the substrate.
      a. Uses: Securing hangers to structure.
      b. Type: Torque-controlled, expansion anchor or adhesive anchor.
      c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
   2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

B. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

C. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.
   1. Depth: 1-1/2 inches.

D. Furring Channels (Furring Members):
   1. Steel Studs and Tracks: ASTM C645.
      a. Minimum Base-Steel Thickness: 0.0296 inch.
      b. Depth: 1-5/8 inches.

E. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.
   1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide the following:
   1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
   1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:
   1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
   2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.
   1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
   3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
   4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
6. Curved Partitions:
   a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
   b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.

E. Direct Furring:
1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.
3. Furring Channels (Furring Members): 16 inches o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
   a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
   a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Do not attach hangers to steel roof deck.
5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Interior gypsum board.
2. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
1. Gypsum board, Type X.
2. Flexible gypsum board.
3. Mold-resistant gypsum board.
4. Cementitious backer units.
5. Interior trim.
6. Joint treatment materials.
7. Laminating adhesive.
8. Sound-attenuation blankets.
9. Acoustical sealant.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.
1. Build mockups for the following:
a. Each level of gypsum board finish indicated for use in exposed locations.
b. Each texture finish indicated.
2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.
   1. Thickness: 5/8 inch.
   2. Long Edges: Tapered.

B. Flexible Gypsum Board: ASTM C1396/C1396M. Manufactured to bend to fit radii and to be more flexible than standard regular-type gypsum board of same thickness.
   1. Thickness: 1/4 inch.
   2. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
   1. Core: 5/8 inch, Type X.
   2. Long Edges: Tapered.
   3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.
   1. Thickness: 5/8 inch.

2. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.
   1. Material: Paper-faced galvanized-steel sheet.
   2. Shapes:
      a. Cornerbead.
      b. LC-Bead: J-shaped; exposed long flange receives joint compound.
      c. L-Bead: L-shaped; exposed long flange receives joint compound.
      d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
      e. Expansion (control) joint.
      f. Curved-Edge Cornerbead: With notched or flexible flanges.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.
   2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
      a. Use setting-type compound for installing paper-faced metal trim accessories.
   3. Fill Coat: For second coat, use setting-type, sandable topping compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:
   1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
   1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
   2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
   1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: As specified in Section 07 92 19 "Acoustical Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

A. Comply with ASTM C840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
   1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
   2. Fit gypsum panels around ducts, pipes, and conduits.
   3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Single-Layer Application:
   1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
   2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
      a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
      b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
   3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

B. Multilayer Application:
   1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing

member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

C. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

D. Curved Surfaces:
1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

3.4 INSTALLATION OF TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.
4. U-Bead: Use where indicated.
5. Curved-Edge Cornerbead: Use at curved openings.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
   1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
      a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."
   3. Level 5: Where indicated on Drawings.
      a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

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SECTION 09 30 13 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Ceramic tile.
   2. Marble tile.
   3. Tile backing panels.
   4. Waterproof membranes.
   5. Crack isolation membranes.

1.2 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Verification:
   1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For tile-setting and -grouting products.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile Units: Furnish a minimum 12 full-size units of each type, composition, color, pattern, and size installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
   2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
   3. Installer employs only Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.
   4. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of mud floors, membranes, gauged porcelain tile/gauged porcelain tile panels and slabs, and large format tile.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup of each type of floor tile installation.
   2. Build mockup of each type of wall tile installation.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
   1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
   1. Waterproof membrane.
   2. Crack isolation membrane.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
   1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.3 TILE PRODUCTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Crossville.
   2. Daltile Corporation.
   3. Emser Tile LLC.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

C. Dynamic Coefficient of Friction: Not less than 0.42.

D. Tile Color and Pattern: As indicated by manufacturer's designations.

E. Grout Color: As indicated by manufacturer's designations.

F. Trim Units: Coordinated with sizes and coursing of adjoining tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as necessary for a complete installation.
   1. Provide trim shapes where necessary to eliminate exposed tile edges

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C1325, Type A, in maximum lengths available to minimize end-to-end butt joints.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. C-Cure; C-Cure Board 990.
      b. Custom Building Products; Wonderboard.
      c. USG Corporation; DUROCK Cement Board.
   2. Thickness: As indicated.

2.5 WATERPROOF MEMBRANES

A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Waterproof Membrane, Fabric-Reinforced, Fluid-Applied: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bostik, Inc.
      b. Custom Building Products.
      c. Laticrete.
      d. MAPEI Corporation.

2.6 CRACK ISOLATION MEMBRANES

A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Crack Isolation Membrane, Fabric-Reinforced, Fluid-Applied: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bostik, Inc.
      b. Custom Building Products.
      c. Laticrete.
      d. MAPEI Corporation.

2.7 SETTING MATERIALS

A. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Product/Manufacturer: Basis of design.
      a. LATICRETE; 254 Platinum.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bostik, Inc.
      b. Custom Building Products.
      c. Laticrete.
      d. MAPEI Corporation.
   3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.15.

2.8 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3.
   1. Product/Manufacturer: Basis of design.
      a. LATICRETE; Spectralock Pro Premium Grout.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Custom Building Products.
      b. Daltile Corporation.
      c. LATICRETE.

2.9 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips:
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Marble Tile Sealer: Manufacturer's standard product for sealing marble tile and that does not change color or appearance of tile.
   1. Product as recommended by the marble tile manufacturer.

2.10 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
      a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
      b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
   3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
   4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION OF CERAMIC TILE

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
   1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
      a. Tile floors in wet areas.
      b. Tile floors consisting of tiles 8 by 8 inches or larger.
      c. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
   1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
   2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
   3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

G. Joint Widths: As indicated on Drawings.

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

J. Metal Edge Strips: Install at locations indicated.

K. Marble Tile Sealer: Apply sealer to marble tiel according to sealer manufacturer's written instructions. Remove excess sealer from tile faces by wiping with soft cloth.

3.4 INSTALLATION OF TILE BACKING PANELS

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 INSTALLATION OF WATERPROOF MEMBRANES

A. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

B. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.6 INSTALLATION OF CRACK ISOLATION MEMBRANES

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

3.7 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove grout residue from tile as soon as possible.

2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.8 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.9 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:
   1. TCNA F115: Thinset mortar; epoxy grout.
      a. Ceramic Tile.
      b. Thinset Mortar: Improved modified dry-setmortar.
      c. Grout: Water-cleanable epoxy grout.
   2. TCNA F122: Thinset mortar on waterproof membrane.
      a. Ceramic Tile.
      b. Thinset Mortar: Improved modified dry-setmortar.
      c. Grout: Water-cleanable epoxy grout.
   3. TCNA F125-Full: Thinset mortar on crack isolation membrane.
      a. Ceramic Tile.
      b. Thinset Mortar: Improved modified dry-setmortar.
      c. Grout: Water-cleanable epoxy grout.

B. Interior Wall Installations, Masonry or Concrete:
   1. TCNA W202: Thinset mortar.
      a. Ceramic Tile.
      b. Thinset Mortar: Improved modified dry-set mortar.
      c. Grout: Water-cleanable epoxy grout.

C. Interior Wall Installations, Metal Studs or Furring:
   1. TCNA W244C or TCNA W244F: Thinset mortar on cementitious backer units.
      a. Ceramic Tile.
      b. Thinset Mortar: Improved modified dry-set mortar.
      c. Grout: Water-cleanable epoxy grout.

END OF SECTION 09 30 13

SECTION 09 30 16 – THIN PORCELAIN PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Thin porcelain panels applied to walls.
   2. Backing panels.
   3. Metal edge strips.

1.2 DEFINITIONS

A. General: Definitions in the ANSI A108 series of installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.3 PRE INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this section.

B. Require attendance of installation material manufacturer, panel supplier, panel installer and installers of related work.

C. Review installation procedures and coordination required with related work. Meeting agenda includes but is not limited to:
   1. Surface preparation.
   2. Thin Porcelain Panel installation procedure.
   3. Grouting material and procedure.
   4. Cleaning products and maintenance.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations of each type of panels and panel pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in panel substrates and finished panel surfaces.

C. Samples for Verification:
   1. Full-size units of each type and composition of panels and for each color and finish required.
   2. Metal edge strips in 6-inch lengths.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Installation Instructions: Manufacturer's printed Technical Manual / Guidelines.

C. Care and Maintenance: Manufacturer’s “How to Care” Brochure

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Panel Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:
   1. The installer must have obtained completion of Crossville Sponsored Training provided by Crossville Inc., a Crossville distributor, or other thin-tile specific training authorized/approved by one of the organizations listed below.
   2. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
   3. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
   4. Installer employs only Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.
   5. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of mud floors, membranes, gauged porcelain tile/gauged porcelain tile panels and slabs, and large format tile.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockup of each type of wall panel installation.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Follow manufacturer’s written guidelines for handling and storage of thin porcelain panels.

B. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling packages.

C. Store panels and cementitious materials on elevated platforms, under cover, and in a dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

E. Store liquid materials in unopened containers and protected from freezing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install panels until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Panels: Obtain panels of each type from single source or producer.
   1. Obtain panels of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
   1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide thin porcelain panels that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
   1. Provide thin porcelain panels complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in installation schedules, and other requirements specified.

2.3 PANEL PRODUCTS

A. Product/Manufacturer: As indicated on Drawings.

B. Trim Units: Coordinated with sizes and coursing of adjoining panels where applicable and matching characteristics of adjoining panels. Provide shapes as required for a complete installation.

C. Provide manufacturer's trim shapes where necessary to eliminate exposed panel edges.

2.4 BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, Type A, in maximum lengths available to minimize end-to-end butt joints.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. C-Cure; C-Cure Board 990.
      b. Custom Building Products; Wonderboard.
      c. USG Corporation; DUROCK Cement Board.
   2. Thickness: As indicated.

2.5 SETTING MATERIALS

A. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Product/Manufacturer: Basis of design.
      a. LATICRETE; 254 Platinum.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Bostik, Inc.
      b. Custom Building Products.
      c. Laticrete.
      d. MAPEI Corporation.
   3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.15.

2.6 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3.
   1. Product/Manufacturer: Basis of design.
      a. LATICRETE; Spectralock Pro Premium Grout.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Custom Building Products.
      b. Daltile Corporation.
      c. LATICRETE.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of setting materials for installations indicated.

B. Metal Edge Strips:
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.

C. Panel Cleaner: A neutral cleaner capable of removing soil and residue without harming panels and grout surfaces, specifically approved for materials and installations indicated by panel and grout manufacturers.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where panels will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting panels are firm; dry; clean; free of coatings that are incompatible with setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind panels has been completed.
   3. Verify that joints and cracks in substrates are coordinated with panel joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Do not proceed with panel work until surfaces and conditions comply with requirements indicated in referenced installation standard and manufacturer’s technical manual / guidelines.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in substrates for panel installation with trowelable leveling and patching compound specifically recommended by setting material manufacturer.

3.3 PANEL INSTALLATION

A. Install thin porcelain panels in accordance with manufacturer's printed instructions.

B. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in installation schedules, and apply to types of setting and grouting materials used.
   1. Install thin porcelain panels in accordance with applicable requirements of ANSI A108 Series for the materials being used.

C. Install expansion and control joints in accordance with TCNA method EJ171. Movement joints in the substrate must not be bridged with the thin porcelain panels.

D. Extend panel work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

E. Accurately form intersections and returns. Perform cutting and drilling of panels without marring visible surfaces. Carefully grind cut edges of panels abutting trim, finish, or built-in items for straight aligned joints. Fit panels closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap panels.

F. Provide manufacturer's trim shapes where necessary to eliminate exposed panel edges.

G. Where accent panels differs in thickness from field panels, vary setting-bed thickness so that panels are flush.

H. Jointing Pattern: Lay panels in pattern indicated. Lay out panel work and center panel fields in both directions in each space or on each wall area. Lay out panel work to minimize the use of pieces that are less than half of a panel. Provide uniform joint widths unless otherwise indicated.
   1. Where panels are specified or indicated to be whole integer multiples of adjoining panels on base, walls, or trim, align joints unless otherwise indicated.

I. Joint Widths: As indicated on Drawings.

J. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and panels. Do not saw-cut joints after installing panels.
   1. Where joints occur in concrete substrates, locate joints in panel surfaces directly above them.

K. Metal Edge Strips: Install at locations indicated.

L. Grout joints in accordance with manufacturer's instructions and ANSI A108.10 or ANSI A108.6.

3.4 BACKING PANEL INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 ADJUSTING AND CLEANING

A. Remove and replace panels that are damaged or that does not match adjoining panels. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all thin porcelain panel surfaces so they are free of foreign matter.
   1. Remove grout residue from panels as soon as possible.
   2. Clean grout smears and haze from panels according to panel and grout manufacturer's written instructions. Use only cleaners recommended by panel and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of panels and other surfaces to be cleaned. Protect metal surfaces from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

A. Protect installed panel work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by panel manufacturer, apply coat of neutral protective cleaner to completed panel walls.

B. Before final inspection, remove protective coverings and rinse neutral protective cleaner from panel surfaces.

3.7 INTERIOR THIN PORCELAIN PANEL INSTALLATION SCHEDULE

A. Interior Wall Installations, Metal Studs or Furring:
   1. Thin Porcelain Panels Installation: TCNA W244C; thinset mortar on cementitious backer units.
      a. Thinset Mortar: Improved modified dry-set mortar.
      b. Grout: Water-cleanable epoxy grout.

END OF SECTION 09 30 16

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SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For components with factory-applied finishes.

C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
   1. Acoustical Panels: Set of 6-inch- square Samples of each type, color, pattern, and texture.
   2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed, but no fewer of 3 boxes of each.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockup of typical ceiling area as shown on Drawings.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Class A according to ASTM E1264.
   2. Smoke-Developed Index: 50 or less.

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Armstrong World Industries, Inc. - Ceilings.
   2. CertainTeed; SAINT-GOBAIN (CertainTeed; Saint-Gobain North America).
   3. Rockfon; ROCKWOOL International.
   4. USG Corporation.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

2.4 ACOUSTICAL PANELS

A. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

B. Color: Standard and custom colors as indicated on Drawings.

2.5 METAL SUSPENSION SYSTEM

A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.
   1. High-Humidity Finish: Where indicated, provide coating tested and classified for "severe environment performance" according to ASTM C635/C635M.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.
   1. Structural Classification: Intermediate -duty system.
   2. End Condition of Cross Runners: butt-edge type.
   3. Face Design: Flat, flush.
   4. Cap Material: Aluminum.

C. Wide-Face, Aluminum-Capped, Double-Web, Hot-Dip Galvanized, G60, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized, G60 coating designation; with prefinished, 15/16-inch- wide aluminum caps on flanges.
   1. Structural Classification: Intermediate -duty system.
   2. Face Design: Flat, flush.
   3. Cap Finish: Standard and custom colors as indicated on Drawings.

2.6 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.

2. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
3. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.

2.7 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant: As specified in Section 07 92 19 "Acoustical Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C636/C636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
   5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
   6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
   7. Do not attach hangers to steel deck tabs.
   8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
   10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
   1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
   2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
   3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
   1. Arrange directionally patterned acoustical panels as follows:
      a. As indicated on reflected ceiling plans.
   2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

SECTION 09 54 23 - LINEAR METAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Linear metal ceilings.

1.2 COORDINATION

A. Coordinate layout and installation of linear metal pans and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For linear metal ceilings.
1. Include reflected ceiling plans, sections, and details, drawn to scale, showing the following:
a. Linear ceiling patterns and joints.
b. Ceiling suspension members.
c. Method of attaching hangers to building structure and locations of cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
d. Ceiling-mounted items including, but not limited to, light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
e. Ceiling perimeter and penetrations through ceiling; trim and moldings.

C. Samples for Initial Selection: For units with factory-applied colors and finishes.
1. Include Samples of accessories involving color and finish selections.

D. Samples for Verification: For the following products:
1. Linear Metal Pans: 12 inches long by full-width Samples of each type, color, and finish and a 12-inch- long spliced section.
2. Suspension-System Members: 12-inch- long Sample of each type.
3. Exposed Molding and Trim: 12-inch- long Samples of each type, color, and finish.
4. Filler Strips: 12-inch- long Samples of each type, color, and finish.
5. Sound Absorbers: 12 inches long by full width.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Product Test Reports: For each linear metal ceiling, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Linear-Metal-Ceiling Components: Quantity of each pan, carrier, accessory, and exposed molding and trim equal to [**2**] <**Insert number**> percent of quantity installed.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by National Voluntary Laboratory Accreditation Program for testing indicated.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Build mockup of each type of linear metal ceiling as shown on Drawings.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver ceiling components and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle ceiling components and accessories in a manner that prevents damage.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not install interior ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Armstrong World Industries, Inc. - Ceilings.
   2. Rockfon.
   3. USG Corporation.

2.2 LINEAR METAL CEILING

A. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

B. Pans and Suspension System:

C. Metal Pans: Type XX.
   1. Surface-Burning Characteristics: For metal-pan assemblies, including backings, determined by testing in accordance with ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 50 or less.
   2. Metal: Aluminum sheet, ASTM B209, alloy and temper recommended by producer and finisher for type of use and finish indicated.
   3. Form: Nonperforated.
   4. Pan Thickness: Not less than 0.032 inch.
   5. Pan Edge Detail: Square.
   6. Metal-Pan Finish: Protected on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping and as follows:
      a. Color-Coated Finish: Manufacturer's standard powder-coat baked paint finish complying with coating manufacturer's written instructions for surface preparation, pretreatment, application, baking, and minimum dry film thickness.
         1) Color and Pattern: As indicated by manufacturer's product designation.

D. Pan Splices: Formed for snap fit into butt-cut pans, 4 inches long.
   1. Finish: Manufacturer's standard.

E. End Caps: Manufacturer's standard material fabricated to fit and conceal exposed ends of pans.
   1. Finish: Matching pan.

F. Moldings and Trim: Manufacturer's standard for exposed members, to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching linear metal pans or extruded plastic unless otherwise indicated.
   1. For Circular Penetrations of Ceiling: Fabricate edge moldings to diameter required to fit penetration exactly.

G. Carrier Suspension System: Manufacturer's standard complying with requirements in ASTM C635/C635M for applications indicated; complete with carriers, splice sections, stabilizing components, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load-resisting struts, fixture adapters, and other suspension components required to support ceiling units and other ceiling-supported construction.
   1. Material: ASTM A653/A653M, hot-dip galvanized, cold-rolled sheet steel, G60 coating designation.
   2. Structural Classification: Heavy-duty system.
   3. Adaptable Carriers: Manufacturer's standard carriers for direct attachment to existing suspended tees.
   4. Carrier Splices: Same metal, profile, and finish as for carriers.
   5. Hold-Down Clips: Manufacturer's standard hold-down clips spaced as standard with manufacturer.
   6. Carrier Finish: Flat black.

2.3 CARRIER-SYSTEM HANGERS, BRACES, AND TIES

A. Attachment Devices: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated.
   1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction as determined by testing in accordance with ASTM E1190 conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung is less than yield stress of wire, but provides not less than 0.106-inch- diameter wire.

C. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed from 0.04-inch-thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which linear metal ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of linear metal ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of linear metal pans.
   1. Balance border widths at opposite edges of each ceiling.
   2. Avoid using less-than-half-width pans at borders.

3.3 INSTALLATION

A. Comply with ASTM C636/C636M and seismic requirement indicated, in accordance with manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns in 3 inches. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate to which hangers are attached and for type of hanger involved.
   5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, power-actuated fasteners, or postinstalled mechanical or adhesive anchors that extend through forms into concrete.
   6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
   7. Do not attach hangers to steel deck tabs.
   8. Do not attach hangers to steel roof deck. Attach hangers to structural members.

9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns in 1-1/2 inches. Suspend bracing from building's structural members as required for hangers and without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim at perimeter of linear metal ceiling area and where necessary to conceal edges and ends of linear metal pans.
1. Screw attach moldings to substrate at intervals of not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system carriers so they are aligned and securely interlocked with one another.
1. Install stabilizer channels, tees, and bars at regular intervals to stabilize carriers and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated.
2. Remove and replace dented, bent, or kinked members.

F. Cut linear metal pans for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness.

G. Install linear metal pans in coordination with suspension system and exposed moldings and trim.
1. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated on Drawings.
2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.
    a. Install pans with butt joints randomly aligned using internal pan splices.
3. Install directionally textured or patterned metal pans in directions indicated.
4. Where metal pan ends are visible, install end caps unless trim is indicated.

H. Install hold-down clips where indicated.

3.4 CLEANING

A. Clean exposed surfaces of linear metal ceilings, including trim and edge moldings, after removing strippable, temporary protective covering if any. Comply with manufacturer's written instructions for stripping of temporary protective covering, cleaning, and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.

END OF SECTION 09 54 23

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SECTION 09 54 26 - SUSPENDED WOOD CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood-veneer, linear-plank ceilings.

1.2 DEFINITIONS

A. NRC: Noise Reduction Coefficient.

1.3 COORDINATION

A. Coordinate layout and installation of wood ceilings and suspension systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For suspended wood ceilings.
   1. Include reflected ceiling plans, sections, and details, drawn to scale, showing the following:
      a. Wood ceiling patterns and joints.
      b. Ceiling suspension members.
      c. Method of attaching hangers to building structure and locations of cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
      d. Ceiling-mounted items including, but not limited to, light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
      e. Ceiling perimeter and penetrations through ceiling; trim and moldings.

C. Samples for Initial Selection: For units with factory-applied colors and finishes.
   1. Include Samples of accessories involving color and finish selections.

D. Samples for Verification: For the following products:
   1. Wood Ceilings: 12-inch- long by 12-inch- wide or full-width Samples of each type, color, and finish.
   2. Suspension-System Members: 12-inch- long Sample of each type.
   3. Exposed Molding and Trim: 12-inch- long Samples of each type, color, and finish.
   4. Veneer Edge Banding: Applied to a cut end of a wood-ceiling Sample for each type, color, and finish.
   5. Sound Absorbers: 12 inches long by full width.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each suspended wood ceiling, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Suspended-Wood-Ceiling Components: Quantity of each wood-ceiling unit, suspension-system component, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by National Voluntary Laboratory Accreditation Program for testing indicated.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Build mockup of each type of suspended wood ceiling as shown on Drawings.
      a. Demonstrate treatment of exposed field cuts.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver ceiling components and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
   1. Store materials flat and level, raised from the floor.

B. Handle ceiling components and accessories in a manner that prevents damage.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install interior ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

1. Store and acclimatize wood products in the spaces where they will be installed for a minimum of 72 hours immediately before ceiling installation.

PART 2 - PRODUCTS

2.1 WOOD-VENEER, LINEAR-PLANK CEILING

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 9Wood, Inc.
   2. Armstrong World Industries.
   3. Rulon International.

B. Linear Ceiling Planks: Manufacturer's standard planks consisting of wood veneer adhered to backs and exposed surfaces of manufacturer's standard composite-wood cores; with square-cut ends.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Surface-Burning Characteristics: Provide products with the following characteristics when tested in accordance with ASTM E84:
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.
   3. Veneer Face Grade: Grade A based on the Decorative Hardwoods Association's HPVA HP-1 definitions and characteristics.
   4. Veneer Species: White oak.
   5. Veneer Cut: Rift cut.
   6. Plank Width: 3-1/4 inches.
   7. Plank Depth: 3/4 inch.
   8. Plank Length: 96 inches.
   9. Plank Long Edge: Square.
      a. Reveal/Plank Spacing: 1-1/8 inch between long edges of planks.
      b. Reveal Filler Strip: Black felt.
   10. Plank End Joints: Butt.
   11. Veneer Adhesive: Manufacturer's standard that complies with requirements in "Performance Requirements" Article.
   12. Factory Finish: Manufacturer's standard finish; applied on every wood surface.
      a. Type: Clear.
      b. Gloss: Manufacturer's standard.

C. Linear-Ceiling-Plank Accessories: Linear-ceiling-plank manufacturer's accessories required to provide a complete installation of ceiling in accordance with manufacturer's written installation instructions.
   1. Plank Splice Plates: Manufacturer's standard.
   2. Acoustic Infill Panels: Scrim of 35 percent fiberglass / 65 precent vinyl on fiberglass with mineral fiber insulation infill panels, with flame-spread index of 25 or less and smoke-developed index of 50 or less as determined by testing in accordance with ASTM E84.

3. Veneer Edge Banding: Manufacturer's standard matching planks for treating cut edges; with pressure-sensitive adhesive backing.
4. Trim: As indicated on the Drawings; with trim connectors recommended in writing by ceiling and suspension-system manufacturers.
    a. Material: Solid wood finished to match planks.

D. Grid Suspension System: ASTM C635/C635M; recommended in writing by ceiling and suspension-system manufacturers for applications indicated; main- and cross-runner system complete with suspension-system components required to support ceiling units and other ceiling-supported construction.
1. Material: ASTM A653/A653M, hot-dip galvanized, cold-rolled sheet steel, G60 coating designation.
2. Structural Classification: Heavy-duty system.
3. Face Width: 15/16 inch.
4. Finish: Flat black.

2.2 SUSPENSION-SYSTEM HANGERS, BRACES, AND TIES

A. Attachment Devices: Size for 5 times the design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated.
1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction as determined by testing in accordance with ASTM E1190 conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C635/C635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which suspended wood ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and with requirements for installation tolerances and other conditions affecting performance of suspended wood ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of suspended wood ceilings.
   1. Balance border widths at opposite edges of each ceiling.
   2. Avoid using less-than-half-width units.

3.3 INSTALLATION

A. Comply with ASTM C636/C636M and seismic requirement indicated, in accordance with manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
   4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns in 3 inches. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate to which hangers are attached and for type of hanger involved.
   5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
   6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, power-actuated fasteners, or postinstalled mechanical or adhesive anchors that extend through forms into concrete.
   7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
   8. Do not attach hangers to steel deck tabs.
   9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
   10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
   11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns in 1-1/2 inches. Suspend bracing from building's structural members as required for hangers and without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim at perimeter of ceiling area and where necessary to conceal edges and ends of wood units.
   1. Screw-attach metal moldings to substrate at intervals of not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
   2. Do not use exposed fasteners on moldings and trim.

E. Grid Suspension Systems: Space main beams at 48 inches o.c.
   1. Install cross tees to form modules sized in accordance with manufacturer's written installation instructions.
   2. Remove and replace dented, bent, or kinked members.

F. Install wood components and accessories in accordance with manufacturer's written instructions and to accommodate natural expansion and contraction of wood products resulting from fluctuations in humidity.

G. Cut wood components for accurate fit at borders and at interruptions and penetrations by other work through ceilings.
   1. Stiffen edges of cut wood components as required to eliminate variations in flatness.

H. Treat field-cut edges of wood components in accordance with manufacturer's written recommendations; finish exposed field cuts to match factory finish.
   1. Wood-Veneer Units: Edge band exposed field-cut edges.

I. Install wood components in coordination with suspension system and moldings and trim.
   1. Install wood components in patterns indicated on Drawings.

J. Install field-constructed access panels in locations indicated on Drawings.

3.4 CLEANING

A. Clean exposed surfaces of ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented units.

END OF SECTION 09 54 26

SECTION 09 64 00 - WOOD FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Field-finished wood flooring.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of floor assembly and accessory. Include plans, sections, and attachment details. Include expansion provisions and trim details.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.
   1. Include Samples of accessories involving color and finish selection.

D. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

1.3 MOCKUPS

A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood flooring materials in unopened cartons or bundles.

B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.

C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.5 FIELD CONDITIONS

A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
   1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
   2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
      a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
      b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.

B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.

C. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Hardwood Flooring: Comply with NWFA A500 for species, grade, and cut.
   1. Certification: Provide flooring that carries NWFA grade stamp on each bundle or piece.

B. Maple Flooring: Comply with applicable MFMA grading rules for species, grade, and cut.
   1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

2.2 FIELD-FINISHED WOOD FLOORING

A. Solid-Wood Flooring, Field-Finished: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.
   1. Grade and Species: Match existing adjacent wood floor
   2. Cut: Match existing adjacent wood floor.
   3. Thickness and Face Width: Match existing adjacent floor.
   4. Lengths: Lengths required to form pattern to match existing.

B. Finish System: Refer to Section 09 93 30 – Wood Floor Refurbishing.

C. Wood Filler: Compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved Samples, provide pigmented filler.

2.3 ACCESSORY MATERIALS

A. Wood Sleepers and Subfloor: As specified in Section 06 10 00 "Rough Carpentry" and Section 06 16 00 "Sheathing."

B. Vapor Retarder: ASTM D4397, polyethylene sheet not less than 8.0 mils thick.

C. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.

D. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
   1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
      b. Perform additional moisture tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

A. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines."

B. Wood Sleepers and Subfloor: Install according to requirements in Section 06 10 00 "Rough Carpentry" and Section 06 16 00 "Sheathing."

C. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch.

D. Vapor Retarder: Comply with the following for vapor retarder installation:
   1. Wood Flooring Nailed to Wood Subfloor: Install flooring over a layer of asphalt-saturated felt.

E. Solid-Wood Flooring: Blind nail or staple flooring to substrate.
   1. Plank Flooring: For flooring of face width more than 3 inches:
      a. Hardwood: Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.

3.4 FIELD FINISHING

A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
   1. Comply with applicable recommendations in NWFA's "Installation Guidelines."

B. Fill open-grained hardwood.

C. Fill and repair wood flooring defects.

D. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.
   1. Apply stains to achieve an even color distribution matching approved Samples.
   2. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.

E. Cover wood flooring before finishing.

F. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

3.5 PROTECTION

A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.
   1. Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 09 64 00

SECTION 09 64 66 - WOOD ATHLETIC FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes wood athletic flooring.

1.2 COORDINATION

A. Coordinate layout and installation of slab depressions to accommodate layout and height of wood athletic flooring assembly.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wood athletic flooring.

B. Shop Drawings: For each type of floor assembly, include the following:
   1. Plans, sections, and attachment details.
   2. Details of concrete-slab depressions.
   3. Expansion provisions and trim details.

C. Samples for Verification: For each type of wood athletic flooring and accessory required; approximately 12 inches long and of same thickness and material indicated for the Work.
   1. Include Sample sets showing the full range of normal color and texture variations expected in wood flooring.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wood athletic flooring and finish systems to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual that has been approved by MFMA as an accredited Installer according to the MFMA Accreditation Program.
   1. Installer responsibilities include installation and field finishing of wood athletic flooring components and accessories, and application of game lines and markers.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for installation.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver floor assembly materials in unopened cartons or bundles.

B. Protect wood from exposure to moisture. Do not deliver wood components until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.

C. Store wood components in a dry, warm, well-ventilated, weathertight location and in a horizontal position.

1.7 FIELD CONDITIONS

A. Conditioning period begins not less than seven days before wood athletic flooring installation, is continuous through installation, and continues not less than seven days after installation.
1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants, but not less than 35 percent or more than 50 percent, in spaces to receive wood athletic flooring during the conditioning period.
2. Wood Conditioning: Move wood components into spaces where they will be installed, no later than beginning of the conditioning period.
a. Do not install wood athletic flooring until wood components adjust to relative humidity of, and are at same temperature as, spaces where they are to be installed.
b. Open sealed packages to allow wood components to acclimatize immediately on moving wood components into spaces in which they will be installed.

B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.

C. Install wood athletic flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Product/Manufacturer: Basis of design.
1. As indicated on Drawings.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. Aacer Flooring, LLC.

2. Connor Sports Flooring.
3. Robbins Inc.
4. Tarkett Sports Indoor.
5. Thor Performance Products.

2.2 SYSTEM DESCRIPTION

A. Species: Maple.

B. Hardwood Top-Layer: 3.5 mm.

C. Middle layer and bottom layer of Spruce.

D. 2 strips of Evazote 50 are glued into the board.

E. Board is 23 mm + Evazote 50 is 5 mm.

F. Cut: Square edged with double tongue and groove sides.

G. Sizing:
1. 1-1/8-inch (28 mm) thickness.
2. 5.39 inches (137 mm) in width.
3. 86.61 inches (2200 mm) in length.

H. Accessories:
1. Vented cove base to allow for resilient wood flooring to expand and contract.
2. Use manufacturer’s matching thresholds, 6.5’ in length, 1 1/8” to 0

2.3 FINISHES

A. Floor-Finish System: System of compatible components recommended in writing by flooring manufacturer, and MFMA approved.
1. Floor-Sealer Formulation: Pliable, penetrating type. MFMA Group 1, Sealers.
2. Finish-Coat Formulation: Formulated for gloss finish indicated and multicoat application.
a. Type: MFMA Group 5, Water-Based Finishes.

2.4 ACCESSORIES

A. Vapor Retarder: ASTM D4397, polyethylene sheet not less than 6 mils thick.

B. Resilient Wall Base: Molded, vented, rubber or vinyl cove base; 4 by 3 by 48 inches; with premolded outside corners.
1. Color: As indicated on Drawings.

C. Fasteners: Type and size recommended by manufacturer, but not less than those recommended by MFMA for application indicated.

D. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood athletic flooring manufacturer.

E. Adhesives: Manufacturer's standard for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
   1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
      b. Perform additional moisture tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

A. Concrete Slabs:
   1. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.
   2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
   3. Remove coatings including curing compounds and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone; use mechanical methods recommended by manufacturer. Do not use solvents.

B. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with wood athletic flooring manufacturer's written instructions, but not less than written recommendations of MFMA applicable to flooring type indicated.

B. Pattern: Lay flooring parallel with long dimension of space to be floored unless otherwise indicated.

C. Expansion Spaces: Provide as indicated, but not less than that required by manufacturer's written instructions and MFMA's written recommendations at walls and other obstructions, and at interruptions and terminations of flooring.
   1. Cover expansion spaces with base molding, trim, and saddles, as indicated on Drawings.

D. Vapor Retarder: Cover entire slab area beneath wood flooring. Install with joints lapped a minimum of 6 inches and sealed.

E. Installation Tolerances: 1/8 inch in 10 feet of variance from level.

3.4 SANDING AND FINISHING

A. Allow installed flooring to acclimate to ambient conditions before sanding.

B. Follow applicable recommendations in MFMA's "Industry Recommendations for Sanding, Sealing, Court Lining, Finishing, and Resurfacing of Maple Gym Floors."

C. Machine sand with coarse, medium, and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups. Remove sanding dust by tack or vacuum.

D. Finish: Apply seal and finish coats of finish system according to finish manufacturer's written instructions. Provide no fewer than four coats total and no fewer than two finish coats.
   1. Water-Based Finishes: Use finishing methods recommended by finish manufacturer to reduce grain raise and sidebonding effect.

3.5 PROTECTION

A. Protect wood athletic flooring during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Substantial Completion.
   1. Do not cover flooring after finishing until finish reaches full cure and not before seven days after applying last finish coat.
   2. Do not move heavy and sharp objects directly over flooring. Protect fully cured floor finishes and surfaces with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 09 64 66

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SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Thermoset-rubber base.
   2. Thermoplastic-rubber base.
   3. Rubber stair accessories.
   4. Rubber molding accessories.
   5. Vinyl molding accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

C. Samples for Initial Selection: For each type of product indicated.

D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Coordinate mockups in this Section with mockups specified in other Sections.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE (RB)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Flexco.
   2. nora systems, Inc.
   3. Roppe Corp.
   4. Tarkett USA Inc.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

C. Product Standard: ASTM F1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
   1. Style:
      a. Style A, Straight.
      b. Style B, Cove.

D. Thickness: 0.125 inch.

E. Height: As indicated on Drawings.

F. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

G. Outside Corners: Job formed.

H. Inside Corners: Job formed.

I. Colors: As indicated by manufacturer's designations.

2.2 THERMOPLASTIC-RUBBER BASE (PRB)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. Flexco.
2. nora systems, Inc.
3. Roppe Corp.
4. Tarkett USA Inc.

B. Product/Manufacturer: Basis of design.
1. As indicated on Drawings.

C. Product Standard: ASTM F1861, Type TP (rubber, thermoplastic).
1. Group: I (solid, homogeneous).
2. Style and Location:
a. Style D, Sculptured: Provide in areas indicated.

1) Profile: As indicated.

D. Height: As indicated on Drawings.

E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: As indicated by manufacturer's designations.

2.3 RUBBER STAIR ACCESSORIES (RSM)

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. Flexco.
2. nora systems, Inc.
3. Roppe Corp.
4. Tarkett USA Inc.

C. Product/Manufacturer: Basis of design.
1. As indicated on Drawings.

D. Stair Treads: ASTM F2169.
   1. Type: TS (rubber, vulcanized thermoset).
   2. Class: 1 (smooth, flat) and 2 (pattern; embossed, grooved, or ribbed).
   3. Group: 1 (embedded abrasive strips) and 2 (with contrasting color for the visually impaired).
   4. Size: Lengths and depths to fit each stair tread in one piece.
   5. Integral Risers: Smooth, flat; in height that fully covers substrate.

E. Landing Tile: Matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

F. Colors and Patterns: As indicated by manufacturer's designations.

2.4 RUBBER MOLDING ACCESSORY

A. Profile and Dimensions: As indicated.

B. Colors and Patterns: As indicated by manufacturer's designations.

2.5 VINYL MOLDING ACCESSORY

A. Profile and Dimensions: As indicated.

B. Colors and Patterns: As indicated by manufacturer's designations.

2.6 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
      a. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
      a. Miter or cope corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Stair Accessories:
   1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
   2. Tightly adhere to substrates throughout length of each piece.

C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:
   1. Remove adhesive and other blemishes from surfaces.
   2. Sweep and vacuum horizontal surfaces thoroughly.
   3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Solid vinyl floor tile.
   2. Rubber floor tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of resilient floor tile.
   1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   2. Show details of special patterns.

C. Samples for Initial Selection: For each type of floor tile indicated.

D. Samples for Verification: Full-size units of each color and pattern of floor tile required.

E. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Floor Tile: Furnish a minimum of two boxes of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
   1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Coordinate mockups in this Section with mockups specified in other Sections.
      a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE (RTF)

A. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

B. Subject to compliance with requirements, provide the Basis of Design product. Other available products/manufacturers offering acceptable equivalent products that may be incorporated into the Work include the following:
   1. Polyflor Mystique PUR.
   2. Forbo Sphera Element Tile Format.
   3. Toli HVT line no wax option.

C. Tile Standard: ASTM F1700.
   1. Class: As indicated by product designations.

D. Thickness: 0.080 inch.

E. Colors and Patterns: As indicated by manufacturer's designations.

2.3 SOLID VINYL FLOOR TILE (LVT)

A. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

B. Subject to compliance with requirements, provide the Basis of Design product. Other available manufacturers offering acceptable equivalent products that may be incorporated into the Work include the following:
   1. Interface.
   2. Patcraft.
   3. Mannington Commercial.

C. Tile Standard: ASTM F1700.
   1. Class: Class III, Printed Film Vinyl Tile.
   2. Type: B, Embossed Surface.

D. Thickness: 0.100 inch.

E. Colors and Patterns: As indicated by manufacturer's designations.

2.4 RUBBER FLOOR TILE (RF)

A. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

B. Subject to compliance with requirements, provide the Basis of Design product. Other available products/manufacturers offering acceptable equivalent products that may be incorporated into the Work include the following:
   1. Nora Norament Castello.

2. Roppe Marbleized Slate Design.
3. Mondo Contract Lava.

C. Tile Standard: ASTM F1344:
1. Class I-A, Homogeneous Rubber Tile, solid color.
2. Class I-B, Homogeneous Rubber Tile, through mottled.

D. Hardness: Grade 1, minimum hardness of 85, measured using Shore, Type A durometer according to ASTM D2240.

E. Thickness: 0.125 inch.

F. Colors and Patterns: As indicated by manufacturer's designations.

2.5 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
    a. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles in pattern of colors and sizes indicated.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and

pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:
   1. Remove adhesive and other blemishes from surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover floor tile until Substantial Completion.

END OF SECTION 09 65 19

SECTION 09 66 00 – TERRAZZO FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Sectio Includes:
1. Terrazzo tile work.
2. Terrazzo floor tile.
3. Precast terrazzo base.
4. Precast terrazzo accessories.
5. Setting material, grouts, sealants and caulks.
6. Installation of terrazzo tiles.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C-140, C-150, C-293, C-373, C-482, C-485, C-499, C-502, C-609, C-648, C-650, C-674, C-1243, C-1378, C-1523.
2. ANSI A137.1 9.6 section.

B. Tile Council of America (TCNA):
1. Tile Council of North America (TCNA) Handbook – latest edition.

C. American National Standards Institute (ANSI):
1. ANSI A108.1 thru A108.17.
2. ANSI A118.1 thru A118.15.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
1. Review methods and procedures related to terrazzo tile including, but not limited to, the following:
a. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
b. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
c. Review special terrazzo tile designs and patterns.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include terrazzo tile installation requirements. Include plans, sections, component details, and relationship to other work. Show layout of the following:
1. Divider strips.
2. Control-joint strips.

3. Expansion-joint strips.
4. Accessory strips.
5. Abrasive strips.
6. Stair treads, risers, and landings.
7. Precast terrazzo jointing and edge configurations.
8. Terrazzo tile patterns.

C. Samples for Verification: For each type, material, color, and pattern of terrazzo tile and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo tile Sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare Samples of same thickness and from same material to be used for the Work, in sizes indicated below:
1. Terrazzo Tile: 6-inch- square Samples.
2. Precast Terrazzo Base: 6-inch- square Samples.
3. Accessories: 6-inch- long Samples of each exposed strip item required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each type of terrazzo material or product.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For terrazzo to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Setting and Grouting Materials: Provide materials obtained from one source for each type and color of grout and setting materials.

B. TCNA Standards: Comply with specifications under the current Handbook for Tile Installation.

C. Manufacturer to supply written Terrazzo Tile Protocol.

D. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Build mockups for each type of terrazzo tile including accessories.
   a. Size: Minimum 25 sq. ft. of terrazzo tile flooring condition for each color and pattern.
   b. Include base.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE AND HANDLING

A. Packaging and Shipping: Terrazzo Tile shall be delivered in original unopened packaging with legible manufacturer identification including size, color, manufacture date and job number.

B. Storage and Protection: Terrazzo Tile shall be stored indoors, in a climate-controlled environment, sheltered from moisture in original packaging. Protect from damage by other trades.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the installation materials manufacturer for optimum results. Do not install products under environmental conditions outside the installation material manufacturer's absolute limits.

1.10 WARRANTY

A. Manufacturer/Installer shall warrant installed terrazzo tile and accessories for a period of 1 year from date of substantial completion against product defects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Terrazzo Tile: Obtain terrazzo tile of each type and color or finish from single source or producer.
   1. Obtain terrazzo tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Wausau Tile, Inc.

C. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

2.2 MATERIALS

A. Portland Cement: ASTM C-150 Specifications for Portland Cement.

B. Aggregates: All aggregates shall meet ASTM C-33 specifications, cleaned and properly graded to size. Aggregate shall be blended to meet individual project requirements.
   1. The aggregates used have a natural color range and come in a variety of sizes and colors. Therefore, the aesthetic class/shade range as per ASTM test C609 will vary from a V1 rating to a V2 rating.
   2. The aggregates used have a natural color range. This can cause slight variances in overall color. Terrazzo tiles should be blended at the job site from several cartons/pallets during installation.

C. Marble chips, size to conform with NTMA gradation standards.

D. Coloring: Pigments used shall be inorganic, resistant to alkalinity and used per manufacturer's recommendations.

E. Caulks & Sealants:
   1. Urethane or Polyurethane Sealant
   2. Color to be selected by Architect from standard color pallet.

F. Cleaner: Liquid neutral chemical cleaner, with pH factor between 7 and 8, of formulation recommended by sealer manufacture for type of precast terrazzo used and complying with NTMA requirements.

G. Sealer: Scotchgard Stone Floor Protector applied to the terrazzo tile prior to packaging.

2.3 MANUFACTURED UNITS

A. Precast Surfaces and Edges:
   1. Chamfered face edges.
   2. Surfaces to be uniform in appearance and free of blemishes.
   3. Precast Terrazzo Base: In configuration as indicated on Drawings.

B. Colors: As indicated on Drawings.

C. Finish/Texture:
   1. Factory Polish or Honed.
   2. Back of terrazzo tile will be ground flat and free from protrusions.

2.4 FABRICATION

A. Mechanically vibrated in molds.

B. Hydraulically pressed by 900-ton/3250 psi press.

C. Steam-cured with 100 percent humidity for 18 hours at 140 degrees F.

D. Factory finish: In-line back and face grinding.

E. Factory applied initial protectant.

F. Packaged and palletized.

2.5 STRIP MATERIAL

A. Abrasive Nosing Strips: Abrasive inserts at nosings. Silicon carbide or aluminum oxide, or combination of both, in epoxy-resin binder and set in channel.
1. Width: 1/2 inch.
2. Depth: As required by terrazzo thickness.
3. Color: As indicated on Drawings.

2.6 SETTING MATERIAL

A. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
2. Provide prepackaged, dry-mortar mix combined with styrene-butadiene-rubber liquid-latex additive at Project site.

2.7 SOURCE QUALITY CONTROL

A. Inspections: Documented inspection of Terrazzo Tile quality control tests.

B. In house testing shall be completed on the first day's production and every 5,000 square feet after for all projects. Testing is performed on the 7th day and the 28th day after the terrazzo tile has been pressed.
1. Compression - ASTM C140 > 8,000 psi average.
2. Absorption - ASTM C140 < 5% average.
3. Flexural - ASTM C293 > 1000 psi average.
4. Specular Gloss Testing at 60 degrees - ASTM D523.
5. Stain testing/initial protection testing.

C. Independent Test Lab completed and verified the following data:
1. 11-13/16 inches by 11-13/16 inches by ½-inch thick Traditional Series Cement Terrazzo Tile.
a. C373 Water Absorption – Passes (Semi-Vitreous).
b. C482 Bond Strength - > 300 psi.
c. C485 Warpage Edge +/- .001% or .002 in.
d. C485 Warpage Diagonal +/- .003% or .010 in.
e. C499 Nominal Size - range of .029 in.
f. C499 Thickness - range of .029 in.
g. C502 Wedging +/- .023% or .028 in.
h. C609 Color Uniformity - V1 – V2.
i. C648 Breaking Strength - > 500 lbs.
j. C650 Resistance to Chemical Substance- not affected.
k. C674 Flexural properties - > 1000 psi. average.
l. Dynamic DCOF – Passes at factory.
m. ANSI A137.1 Section 9.6.1 "Wet Dynamic Coefficient of Friction (DCOF)".
n. Average Polished Finish = .46 / Average Honed Finish = .54.

o. C1243 Deep Abrasion Wear – passes (meets p3 standards).
p. C1378 Resistance to staining - not affected.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where terrazzo tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that substrates for setting terrazzo tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
   2. Verify that concrete substrates for terrazzo tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
      a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
      b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
   3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind terrazzo tile has been completed.
   4. Verify that joints and cracks in terrazzo tile substrates are coordinated with terrazzo tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.

B. Fill cracks, holes, and depressions in concrete substrates for terrazzo tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by terrazzo tile-setting material manufacturer.

C. Blending: For tile exhibiting color variations, verify that terrazzo tile has been factory blended and packaged so terrazzo tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend terrazzo tiles at Project site before installing.

3.3 INSTALLATION

A. All installations of terrazzo tile shall comply with the appropriate Installation method as depicted in the current edition of the Tile Council of North America Handbook for Ceramic, Glass, and Stone Installation.

B. When setting cementitious terrazzo tile an ANSI A118.4 mortar is required. The setting materials manufacturer's printed installation instructions are to be followed in every instance.

C. A minimum of 95 percent thin-set coverage is recommended on the back of the terrazzo tile with no voids exceeding two square inches and no voids with 2 inches of the edges. All corners and edges must be fully supported and back buttering is required on terrazzo tiles larger than 12 inches to reach these requirements.

D. ANSI A-108.5 installation specifications that correspond with the selected TCNA Installation Method are required. This includes substrate and surfaces inspections, location and frequency of EJ171 Movement Joint Guidelines, Placement Techniques, and grouting procedures.
   1. Minimum recommended grout joint width is 1/8-inch.
   2. Deflection requirement of L/360.
   3. The maximum allowable substrate variation can be no more the 1/8-inch in 10 feet and 1/16-inch in 24 inches.

E. Applied Initial Protectant - 3M Scotchgard™ Stone Floor Protector:
   1. When using a heavy pigmented grout, it's recommended to use a grout release prior to grouting. A test area is recommended to ensure the grout release was adequately applied.
   2. If a slight grout haze occurs, it can be effectively removed from the terrazzo tile by using a 3M™ Eraser Pad 3600 Pink pad with water and or 3M™ Neutral Cleaner. A floor buffer might be recommended to assist in cleaning
   3. If a more difficult stain occurs, use a Scotch-Brite™ Doodlebug™ Easy Erasing Pad 4610 along with water and or 3M™ Neutral Cleaner. A floor buffer might be recommended to assist in cleaning.

3.4 CARE & MAINTENANCE

A. Cleaning:
   1. Dust mop or vacuum to remove sand, dust and other contaminants off the surface.
   2. Clean up spills immediately and damp mop lightly soiled floors with a neutral cleaner.
   3. For more aggressive cleaning use a mechanical buffer or auto scrubber along with a 3M Red Buffer Pad 5100 and Neutral Cleaner per the manufacturer's recommendations.
   4. For cleaning combined with light polishing, the Scotch-Brite Purple Diamond Pad Plus may be used on an auto scrubber.
   5. If a stain occurs, see 3M's technical bulletin titled Repair of Etch or Stained Terrazzo Tiles to assist with the repair.

6. Do not use acidic cleaners, cleaners that contain citrus (d-limonene), 2-butoxyethanol (butyl cellusolve), amine-based cleaners, isopropyl alcohol, solvent based cleaners, degreasers, or non-neutral cleaners.
7. Do not use spray buff products or chemical dust mop treatments.

B. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo tile is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 66 00

SECTION 09 66 23 - RESINOUS MATRIX TERRAZZO

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Thin-set, epoxy-resin terrazzo.
   2. Precast epoxy-resin terrazzo units.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to terrazzo including, but not limited to, the following:
      a. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
      b. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
      c. Review special terrazzo designs and patterns.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include terrazzo installation requirements. Include plans, sections, component details, and relationship to other work. Show layout of the following:
   1. Accessory strips.
   2. Precast terrazzo jointing and edge configurations.
   3. Terrazzo patterns.

C. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo Sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare Samples of same thickness and from same material to be used for the Work, in sizes indicated below:
   1. Terrazzo: 10-inch- square Samples.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator and Installer.

B. Material Certificates: For each type of terrazzo material or product.

C. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For terrazzo to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Engage a fabricator who is a contractor member of NTMA.
   2. Engage a fabricator who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.
   3. Engage a fabricator with at least five (5) years of satisfactory experience in the fabrication of precast epoxy terrazzo. Terrazzo fabricator shall demonstrate experience during last five (5) years of at least (5) projects of comparable scope and complexity of at least 50 percent of the total square footage of this project.
   4. Installer: Same as precast terrazzo fabricating entity.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Build mockups for terrazzo including accessories.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.

B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.

B. Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.

C. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

D. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

E. Control and collect water and dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain primary terrazzo materials from single source from single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

B. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. NTMA Standards: Comply with NTMA's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

2.3 EPOXY-RESIN TERRAZZO

A. Epoxy-Resin Terrazzo: Comply with manufacturer's written instructions for matrix and aggregate proportions and mixing.

B. Mix Color and Pattern: As indicated on Drawings..

C. Materials:
   1. Primer: Manufacturer's product recommended for substrate and use indicated.
   2. Epoxy-Resin Matrix: Manufacturer's standard recommended for use indicated and in color required for mix indicated.
      a. Physical Properties without Aggregates:
         1) Hardness: 60 to 85 per ASTM D2240, Shore D.
         2) Minimum Tensile Strength: 3000 psi per ASTM D638 for a 2-inch specimen made using a "C" die per ASTM D412.
         3) Minimum Compressive Strength: 10,000 psi per ASTM D695, Specimen B cylinder.

4) Chemical Resistance: No deleterious effects by contaminants listed below after seven-day immersion at room temperature per ASTM D1308.
   a) Distilled water.
   b) Mineral water.
   c) Isopropanol.
   d) Ethanol.
   e) 0.025 percent detergent solution.
   f) 1.0 percent soap solution.
   g) 5 percent acetic acid.
   h) 10 percent sodium hydroxide.
   i) 10 percent hydrochloric acid.
   j) 30 percent sulfuric acid.

b. Physical Properties with Aggregates: For terrazzo blended according to manufacturer's recommendations with one part epoxy resin with three parts marble aggregate consisting of 60 percent No. 1 chips and 40 percent No. 0 chips that is ground and grouted to a 1/4-inch nominal thickness, and cured for 7 days at 75 deg F plus or minus 2 deg F and at 50 percent plus or minus 2 percent relative humidity.
   1) Flammability: Self-extinguishing, maximum extent of burning 1/4 inch according to ASTM D635.
   2) Thermal Coefficient of Linear Expansion: 0.0025 inch/inch per deg F according to ASTM C531.

3. Aggregates: Comply with NTMA gradation standards for mix indicated and contain no deleterious or foreign matter.
   a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C131/C131M.
   b. 24-Hour Absorption Rate: Less than 0.75 percent.
   c. Dust Content: Less than 1.0 percent by weight.
4. Finishing Grout: Resin based.

2.4 PRECAST EPOXY-RESIN TERRAZZO

A. Precast Terrazzo Units: Comply with manufacturer's written instructions and shop drawings for fabricating precast units in sizes and profiles indicated. Reinforce units as required by unit sizes, profiles, and thicknesses and as recommended by manufacturer. Finish exposed-to-view edges and reveals to match face finish. Ease exposed edges to 1/8-inch radius.

2.5 MISCELLANEOUS ACCESSORIES

A. Anchoring Devices:
   1. Precast Terrazzo: Provide mechanical anchoring devices as recommended by fabricator for proper anchorage and support of units for conditions of installation and support.

B. Resinous Matrix Terrazzo Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.

C. Sealer: Stain-resistant, penetrating-type sealer that is chemically neutral; does not affect terrazzo color or physical properties; and is recommended by sealer manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 PREPARATION

A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.

3.3 EPOXY-RESIN TERRAZZO INSTALLATION

A. Comply with NTMA's written recommendations for terrazzo and accessory installation.

B. Apply primer to terrazzo substrates according to manufacturer's written instructions.

3.4 PRECAST TERRAZZO INSTALLATION

A. Install precast terrazzo units using method recommended in writing by NTMA and manufacturer unless otherwise indicated.

B. Do not install units that are chipped, cracked, discolored, or improperly finished.

C. Seal joints between units with joint compound matching precast terrazzo matrix.

3.5 CLEANING AND PROTECTION

A. Cleaning:
   1. Remove grinding dust from installation and adjacent areas.
   2. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.

B. Sealing:
   1. Seal surfaces according to NTMA's written recommendations.
   2. Apply sealer according to sealer manufacturer's written instructions.

C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 66 23

SECTION 09 67 23 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Resinous flooring.
   2. Integral cove base accessories.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .
   1. Review manufacturer's written instructions for substrate preparation and environmental conditions affecting resinous flooring installation.
   2. Review details of integral cove bases.
   3. Review manufacturer's written instructions for installing resinous flooring systems.
   4. Review protection measures for adjacent construction and installed flooring, floor drainage requirements, curbs, base details, and so forth.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's technical data, installation instructions, and recommendations for each resinous flooring component required.

B. Samples for Initial Selection: For each type of exposed finish required.

C. Samples for Verification: For each resinous flooring system required and for each color and texture specified, 6 inches square, applied to a rigid backing by Installer for this Project.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Material Certificates: For each resinous flooring component.

C. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.

B. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
   1. The installer shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
   2. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Apply full-thickness mockups on 96-inch- square floor area selected by Architect.
   2. Simulate finished lighting conditions for Architect's review of mockups.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring installation.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring installation.

C. Close spaces to traffic during resinous flooring installation and for 24 hours after installation unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flammability: Self-extinguishing in accordance with ASTM D635.

2.2 RESINOUS FLOORING

A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.
   1. Products/Manufacturer: Basis of design.
      a. StonClad UR and ShieldTop US; Stonhard, Inc.
      b. Sealer: StonSeal CF7; Stonhard, Inc.

B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

C. System Characteristics:
   1. Color and Pattern: Match existing adjacent floor.
   2. Wearing Surface: Match existing adjacent floor.

D. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested in accordance with test methods indicated:
   1. Compressive Strength: 5000 psi minimum in accordance with ASTM C579.
   2. Tensile Strength: 1000 psi minimum in accordance with ASTM C307.
   3. Flexural Strength: 2000 psi minimum in accordance with ASTM C580.
   4. Water Absorption: 1 percent maximum in accordance with ASTM C413.
   5. Hardness: 80 to 84, Shore D in accordance with ASTM D2240.

E. Primer: Type recommended in writing by resinous flooring manufacturer for substrate and resinous flooring system indicated.

F. Reinforcing Membrane: Flexible resin formulation that is recommended in writing by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.

G. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended in writing by manufacturer for installation indicated.

H. Topcoats: Sealing or finish coats.
   1. Formulation Description: 100 percent solids.
   2. Type: Clear.
   3. Number of Coats: One.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resinous flooring systems.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare and clean substrates in accordance with resinous flooring manufacturer's written instructions for substrate indicated to ensure adhesion.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
   1. Roughen concrete substrates as follows:
      a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
      b. Comply with requirements in SSPC-SP 13/NACE No. 6, with a Concrete Surface Profile of 3 or greater in accordance with ICRI Technical Guideline No. 310.2R, unless manufacturer's written instructions are more stringent.
   2. Repair damaged and deteriorated concrete in accordance with resinous flooring manufacturer's written instructions.
   3. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. , and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
   4. Alkalinity and Adhesion Testing: Perform tests recommended in writing by resinous flooring manufacturer. Proceed with installation only after substrate alkalinity is not less than 6 or more than 8 pH unless otherwise recommended in writing by flooring manufacturer,

C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates in accordance with manufacturer's written instructions.
   1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring in accordance with manufacturer's written instructions.

D. Resinous Materials: Mix components and prepare materials in accordance with resinous flooring manufacturer's written instructions.

3.3 INSTALLATION

A. Apply components of resinous flooring system in accordance with manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness specified.
   1. Coordinate installation of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
   2. Cure resinous flooring components in accordance with manufacturer's written instructions. Prevent contamination during installation and curing processes.
   3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. Primer: Apply primer over prepared substrate at spreading rate recommended in writing by manufacturer.

C. Reinforcing Membrane: Apply reinforcing membrane to substrate cracks .

D. Field-Formed Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring coats. Apply in accordance with manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

E. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness specified for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended in writing by manufacturer.

F. Topcoats: Apply topcoats in number indicated for flooring system specified, at spreading rates recommended in writing by manufacturer, and to produce wearing surface specified.

3.4 FIELD QUALITY CONTROL

A. Material Sampling: Owner may, at any time and any number of times during resinous flooring installation, require material samples for testing for compliance with requirements.
   1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
   2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
   3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with

unacceptable materials, and reinstall flooring materials to comply with requirements.

B. Core Sampling: At Owner's direction and at locations designated by Owner, take one core sample per 1000 sq. ft. of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring. Correct deficiencies in installed flooring as indicated by testing.

3.5 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 09 67 23

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Modular carpet tile.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
      a. Review delivery, storage, and handling procedures.
      b. Review ambient conditions and ventilation procedures.
      c. Review subfloor preparation procedures.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
   2. Include manufacturer's written installation recommendations for each type of substrate.

B. Shop Drawings: For carpet tile installation, plans showing the following:
   1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   2. Carpet tile type, color, and dye lot.
   3. Type of subfloor.
   4. Type of installation.
   5. Pattern of installation.
   6. Pattern type, location, and direction.
   7. Pile direction.
   8. Type, color, and location of insets and borders.
   9. Type, color, and location of edge, transition, and other accessory strips.
   10. Transition details to other flooring materials.

C. Samples for Initial Selection: For each type of carpet tile.
   1. Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.

D. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
   1. Carpet Tile: Full-size Sample.

2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.

E. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Carpet Tile: Furnish 2 boxes of carper tile for each type installed.

1.7 QUALITY ASSURANCE

A. Drawings and/or Specifications indicate specific manufacturer's product including make or model number or other designation, to establish the significant qualities and aesthetics.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit product data and samples indicating full range of color and pattern to Architect for review.

B. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
1. Build mockups at locations and in sizes shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with the Carpet and Rug Institute's CRI 104.

1.9 FIELD CONDITIONS

A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.10 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, the following:
      a. More than 10 percent edge raveling, snags, and runs.
      b. Dimensional instability.
      c. Excess static discharge.
      d. Loss of tuft-bind strength.
      e. Loss of face fiber.
      f. Delamination.
   3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Bentley Mills.
   2. Mannington Commercial.
   3. Interface Flooring.

B. Products: For carpets other than basis of design, the equals shall match full design intent including colors and patterns from full range including customs.

C. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

D. Color: As indicated by manufacturer's designations.

E. Performance Characteristics:
   1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

B. Examine carpet tile for type, color, pattern, and potential defects.

C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
   1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
      b. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns indicated on Drawings, if not indicated, asrecommended in writing by carpet tile manufacturer.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
   2. Remove yarns that protrude from carpet tile surface.
   3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.

C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 13

SECTION 09 72 00 - WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Vinyl wall covering.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.

B. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement seams and termination points.

C. Samples for Initial Selection: For each type of wall covering.

D. Samples for Verification: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36 inches long in size.
   1. Wall-Covering Sample: From same production run to be used for the Work, with specified treatments applied.
      a. Show complete pattern repeat.
      b. Mark top and face of fabric.

E. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Covering Materials: For each type, color, texture, and finish, full width by length to equal to 5 percent of amount installed.

1.7 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for installation.
   1. Build mockups for each type of wall covering on each substrate required. Comply with requirements in ASTM F1141 for appearance shading characteristics.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.
   1. Wood-Veneer Wall Coverings: Condition spaces for not less than 48 hours before installation.

B. Lighting: Do not install wall covering until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates in accordance with test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.

2.2 VINYL WALL COVERING

A. Products/Manufacturers: Basis of design.
   1. As indicated on Drawings.

2.3 ACCESSORIES

A. Adhesive: Mildew-resistant, nonstaining, strippable adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.

B. Primer/Sealer: Mildew resistant, complying with requirements in Section 09 91 23 "Interior Painting" and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.

C. Seam Tape: As recommended in writing by wall-covering manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation surfaces being true in plane and vertical and horizontal alignment, maximum moisture content, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, and mildew.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
   1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
   2. Plaster: Allow plaster to cure for at least 90 days. Neutralize areas of high alkalinity. Apply primer/sealer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
   3. Metals: If not factory primed, clean and apply metal primer as recommended in writing by metal-primer manufacturer and wall-covering manufacturer.
   4. Gypsum Board: Apply primer/sealer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
   5. Painted Surfaces:

a. Check for pigment bleeding. Apply primer/sealer to areas susceptible to pigment bleeding as recommended in writing by primer/sealer manufacturer.
b. Sand gloss, semigloss, and eggshell finishes with fine sandpaper.

D. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

E. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

3.3 INSTALLATION OF WALL COVERING

A. Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated.

B. Cut wall-covering strips in roll number sequence. Change the roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.
1. For solid-color, even-texture, or random-match wall coverings, reverse every other strip.

D. Install wall covering without lifted or curling edges and without visible shrinkage.

E. Install seams vertical and plumb at least 6 inches from outside corners and 6 inches from inside corners unless a change of pattern or color exists at corner. Horizontal seams are not permitted.

F. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without overlaps or gaps between strips.

G. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

3.4 CLEANING

A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 09 72 00

SECTION 09 77 00 – SPECIAL WALL SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wood-veneer, linear-plank wall panels.

1.2 COORDINATION

A. Coordinate layout and installation of wood panels and furring with other construction that penetrates walls or is supported by them, including electrical fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For wall panels.
   1. Include plans, sections, and details, drawn to scale, showing the following:
      a. Wood panel patterns and joints.
      b. Furring members.
      c. Method of attaching to building structure and locations of cast-in-place anchors, clips, and other panel attachment devices whose installation is specified in other Sections.
      d. Wall-mounted items including, but not limited to, electrical fixtures, grilles, speakers, sprinklers, and access panels.
      e. Wal perimeter and penetrations through panels; trim and moldings.

C. Samples for Initial Selection: For units with factory-applied colors and finishes.
   1. Include Samples of accessories involving color and finish selections.

D. Samples for Verification: For the following products:
   1. Wood Wall Panels: 12-inch- long by 12-inch- wide or full-width Samples of each type, color, and finish.
   2. Exposed Molding and Trim: 12-inch- long Samples of each type, color, and finish.
   3. Veneer Edge Banding: Applied to a cut end of a wood panel. Sample for each type, color, and finish.
   4. Sound Absorbers: 12 inches long by full width.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Wood Wall Panel Components: Quantity of each wood wall panel unit, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
   1. Build mockup of each type of wood wall panels as shown on Drawings.
      a. Demonstrate treatment of exposed field cuts.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver panel components and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
   1. Store materials flat and level, raised from the floor.

B. Handle wall panel components and accessories in a manner that prevents damage.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install interior wood wall panels until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above walls is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
   1. Store and acclimatize wood products in the spaces where they will be installed for a minimum of 72 hours immediately before panel installation.

PART 2 - PRODUCTS

2.1 WOOD-VENEER, LINEAR-PLANK WALL PANELS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 9Wood, Inc.
   2. Armstrong World Industries.

3. Rulon International.

B. Linear Planks: Manufacturer's standard planks consisting of wood veneer adhered to backs and exposed surfaces of manufacturer's standard composite-wood cores; with square-cut ends.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Surface-Burning Characteristics: Provide products with the following characteristics when tested in accordance with ASTM E84:
      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.
   3. Veneer Face Grade: Grade A based on the Decorative Hardwoods Association's HPVA HP-1 definitions and characteristics.
   4. Veneer Species: White oak.
   5. Veneer Cut: Rift cut.
   6. Plank Width: 3-1/4 inches.
   7. Plank Depth: 3/4 inch.
   8. Plank Length: 96 inches.
   9. Plank Long Edge: Square.
      a. Reveal/Plank Spacing: 1-1/8 inch between long edges of planks.
      b. Reveal Filler Strip: Black felt.
   10. Plank End Joints: Butt.
   11. Veneer Adhesive: Manufacturer's standard that complies with requirements in "Performance Requirements" Article.
   12. Factory Finish: Manufacturer's standard finish; applied on every wood surface.
      a. Type: Clear.
      b. Gloss: Manufacturer's standard.

C. Wall Panel Accessories: Manufacturer's accessories required to provide a complete installation of wall panels in accordance with manufacturer's written installation instructions.
   1. Plank Splice Plates: Manufacturer's standard.
   2. Acoustic Infill Panels: Scrim of 35 percent fiberglass / 65 precent vinyl on fiberglass with mineral fiber insulation infill panels, with flame-spread index of 25 or less and smoke-developed index of 50 or less as determined by testing in accordance with ASTM E84.
   3. Veneer Edge Banding: Manufacturer's standard matching planks for treating cut edges; with pressure-sensitive adhesive backing.
   4. Trim: As indicated on the Drawings; with trim connectors recommended in writing by panel manufacturer.
      a. Material: Solid wood finished to match planks.

D. Furring System: Refer to Section 06 10 00 – Rough Carpentry.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which wood panels attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect panel installation and anchorage, and with requirements for installation tolerances and other conditions affecting performance of wood panels.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions.

B. Install edge moldings and trim at perimeter of panels and where necessary to conceal edges and ends of wood units.
   1. Do not use exposed fasteners on moldings and trim.

C. Install wood components and accessories in accordance with manufacturer's written instructions and to accommodate natural expansion and contraction of wood products resulting from fluctuations in humidity.

D. Cut wood components for accurate fit at borders and at interruptions and penetrations by other work through walls.
   1. Stiffen edges of cut wood components as required to eliminate variations in flatness.

E. Treat field-cut edges of wood components in accordance with manufacturer's written recommendations; finish exposed field cuts to match factory finish.
   1. Wood-Veneer Units: Edge band exposed field-cut edges.

F. Install wood components in coordination with moldings and trim.
   1. Install wood components in patterns indicated on Drawings.

3.3 CLEANING

A. Clean exposed surfaces of panels, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented units.

END OF SECTION 09 77 00

SECTION 09 84 33 - SOUND-ABSORBING WALL UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
   1. Sound-absorbing wall panels.

1.2 DEFINITIONS

A. NRC: Noise Reduction Coefficient.

B. SAA: Sound Absorption Average.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include panel edge, material, and mounting indicated.

B. Shop Drawings: For unit assembly and installation.
   1. Include plans, elevations, sections, and mounting devices and details.
   2. Include details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge profile and core materials.
   3. Include details at cutouts and penetrations for other work.

C. Samples for Verification: For the following products:
   1. Panel Edge: 12-inch- long Sample(s) showing each edge profile, corner, and finish.
   2. Panel Material: 12-inch- square Sample at corner with required color.
   3. Mounting Devices: Full-size Samples.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Electrical outlets, switches, and thermostats.
   2. Items penetrating or covered by units including the following:
      a. Lighting fixtures.
      b. Air outlets and inlets.
      c. Speakers.
      d. Alarms.
      e. Sprinklers.
      f. Access panels.

B. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of unit to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal instructions.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
   1. Build mockup of typical wall area 48 inches wide by full height. Include intersection of wall and ceiling, corners, and perimeters.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with unit manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install units until a permanent level of lighting is provided on surfaces to receive the units.

C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.

D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to the following:

a. Acoustical performance.
b. Warping of panel.

2. Warranty Period: Thirty years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wall units specified in this Section from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
a. Flame-Spread Index: 25 or less.
b. Smoke-Developed Index: 450 or less.
2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.3 SOUND-ABSORBING WALL UNITS

A. Absorbing Wall Panel (SAWP):

B. Product/Manufacturer: Basis of design.
1. As indicated on Drawings.

C. Panels:
1. Surface Texture: Coarse.
2. Composition: Aspen wood fibers bonded with inorganic hydraulic cement
3. Color: As indicated on Drawings.
4. Size and Thickness: As indicated on Drawings.
5. Edge Profile: Beveled on direct-attach.
6. Noise Reduction Coefficient (NRC): ASTM C 423 (A-mounting); (Standard NRC 0.40); ASTM C 423 (D-20 mounting) (Standard NRC 0.45); ASTM C 423 (C-20 mounting) (Standard NRC 0.80); ASTM C 423 (C-40 mounting) (Standard NRC 0.85) Classified with UL label.
7. Flame Spread: ASTM E 1264; (Fire Class A).
8. Dimensional Stability: HumiGuard Plus.
9. USDA Certified Biobased Product, 98%.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fabric, fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

B. Comply with manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb and Level: Plus or minus 1/16 inch in 48 inches, noncumulative.

B. Variation of Joint Width: Not more than 1/32-inch variation from reveal line in 48 inches, noncumulative.

3.4 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 09 84 33

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Primers.
   2. Water-based finish coatings.
   3. Dry fall coatings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Include preparation requirements and application instructions.
   2. Indicate VOC content.

B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches square.
   2. Apply coats on Samples in steps to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

C. Product Schedule: Use same designations indicated on Drawings and in the Interior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.3 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Benjamin Moore & Co. (United States).
   2. Pittsburgh Paints (formerly PPG Paints).
   3. Sherwin-Williams Company (The).

B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL

A. Material Compatibility:
   1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As indicated in a color schedule.

2.3 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated latex block fillers.
   1. Benjamin Moore; Moorcraft SuperCraft Block Filler 285: Applied at a dry film thickness of not less than 8.1 mils.
   2. Pittsburgh Paints; Speedhide Hi Fill Block Filler 6-15XI: Applied at a dry film thickness of not less than 8.2 mils.
   3. Sherwin-Williams; PrepRite Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils.

2.4 INTERIOR PRIMERS

A. Interior Concrete and Masonry Primer: Factory-formulated acrylic-latex interior primer for interior application.
   1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer 253: Applied at a dry film thickness of not less than 1.2 mils.
   2. Pittsburgh Paints; Perma-Crete Acrylic Masonry Surface Sealer 4-808/4-809: Applied at a dry film thickness of not less than 1.4 mils.
   3. Sherwin-Williams; Loxon Concrete and Masonry Primer LX02WQ050: Applied at a dry film thickness of not less than 3.2 mils.

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.
   1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer 253: Applied at a dry film thickness of not less than 1.2 mils.
   2. Pittsburgh Paints; Speedhide® zero Interior Zero-VOC** Latex Sealer, 6-4900XI: Applied at a dry film thickness of not less than 1.4 mils.
   3. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.1 mils.

C. Interior Plaster Primer: Factory-formulated latex-based primer for interior application.
   1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer 253: Applied at a dry film thickness of not less than 1.2 mils.
   2. Pittsburgh Paints; SEAL GRIP Int/Ext Acrylic Primer Sealer 17-921XI: Applied at a dry film thickness of not less than 1.8 mils.
   3. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.1 mils.

D. Interior Wood Primer for Acrylic-Enamel and Semigloss Alkyd-Enamel Finishes: Factory-formulated alkyd- or acrylic-latex-based interior wood primer.
   1. Benjamin Moore; Moorcraft Super Spec Alkyd Enamel Underbody and Primer Sealer C245: Applied at a dry film thickness of not less than 1.5 mils.
   2. Pittsburgh Paints; SEAL GRIP Int/Ext Acrylic Primer Sealer 17-921: Applied at a dry film thickness of not less than 1.8 mils.
   3. Sherwin-Williams; Premium Wall and Wood Interior Latex Primer B28W8111 Series: Applied at a dry film thickness of not less than 1.8 mils.

E. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.
   1. Benjamin Moore; Moorcraft SuperSpec Alkyd Enamel Underbody and Primer Sealer C245: Applied at a dry film thickness of not less than1.5 mils.
   2. Pittsburgh Paints; Pitt-Tech Plus EP Interior/Exterior Acrylic DTM Primer, 90-
   3. 1912 Series. Applied Dry Film Thickness: 2.0 mils min. mils.
   4. Sherwin Williams Pro Industrial Pro Cryl Primer, B66 Series, Applied at a dry film thickness of not less than 1.9 mils.

F. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.
1. Benjamin Moore; Moore's SSHP Acrylic Metal Primer P04: Applied at a dry film thickness of not less than 2.0 mils.
2. Pittsburgh Paints; Pitt-Tech Plus EP Interior/Exterior Acrylic DTM Primer, 90-
3. 1912 Series. Applied Dry Film Thickness: 2.0 mils min. mils.
4. Sherwin-Williams; DTM Acrylic Primer/Finish B66W1: Applied at a dry film thickness of not less than 3.0 mils.

G. Interior Flat Acrylic Dry-Fall: Factory-formulated flat dry-fall for interior application.
1. Benjamin Moore; 153 Sweep-Up Spray Latex Flat: Applied at a dry film thickness of not less than 1.5 mils.
2. Pittsburgh Paints; SPEEDHIDE SUPER TECH WB Int. Dry Fall Latex 6-725XI: Applied at a dry film thickness of not less than 2.4 mils.
3. Sherwin-Williams; Pro Industrial Low VOC Waterborne Acrylic Dryfall B42W81: Applied at a dry film thickness of not less than 1.7 mils.

2.5 INTERIOR FINISH COATS

A. Interior Flat Acrylic Paint: Factory-formulated flat latex paint for interior application.
1. Benjamin Moore; Moorcraft Super Spec Latex Flat 275: Applied at a dry film thickness of not less than 1.2 mils.
2. Pittsburgh Paints; Speedhide Interior Zero VOC Latex Flat, 6-70ZV Series. Applied Dry Film Thickness: 1.2 mils min.
3. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat Wall Paint B30W12651 Series: Applied at a dry film thickness of not less than 1.4 mils.

B. Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell latex interior enamel.
1. Benjamin Moore; Moorcraft Super Spec Latex Eggshell Enamel 274: Applied at a dry film thickness of not less than 1.3 mils.
2. Pittsburgh Paints; Speedhide Interior Zero VOC Latex Eggshell, 6-411ZV Series. Applied Dry Film Thickness: 1.5 mils min.
3. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Egg-Shell Enamel B20W12651 Series: Applied at a dry film thickness of not less than 1.6 mils.

C. Interior Semigloss Acrylic Enamel: Factory-formulated semigloss latex enamel for interior application.
1. Benjamin Moore; Moorcraft Super Spec Latex Semi-Gloss Enamel 276: Applied at a dry film thickness of not less than 1.2 mils.
2. Pittsburgh Paints; Speedhide Zero Interior Latex Semi-Gloss, 6-500ZV Series. Applied Dry Film Thickness: 1.5 mils min.
3. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel B31W02651 Series: Applied at a dry film thickness of not less than 1.3 mils.

D. Interior Full-Gloss Acrylic Enamel: Factory-formulated full-gloss latex interior enamel.
1. Benjamin Moore; Moore's SSHP Acrylic Gloss Enamel P28: Applied at a dry film thickness of not less than 2.0 mils.
2. Pittsburgh Paints; Speedhide Int/Ext Gloss 100% Acrylic 6-8534: Applied at a dry film thickness of not less than 1.2 mils.

3. Sherwin-Williams; ProMar 200 Interior Latex Gloss Enamel B21W12651: Applied at a dry film thickness of not less than 1.5 mils.

E. Interior Flat Acrylic Dry-Fall: Factory-formulated flat dry-fall for interior application.
1. Benjamin Moore; 153 Sweep-Up Spray Latex Flat: Applied at a dry film thickness of not less than 1.5 mils.
2. Pittsburgh Paints; SPEEDHIDE SUPER TECH Int Dry Fog Flat 6-725XI: Applied at a dry film thickness of not less than 2.4 mils.
3. Sherwin-Williams; Waterborne Acrylic Dryfall B42 Series: Applied at a dry film thickness of not less than 4 mils.

2.6 INTERIOR EPOXY PRIMER AND FINISH COATS

A. Interior Epoxy System over Concrete Masonry Units: Waterborne Acrylic Epoxy.
1. Block Filler:
a. Benjamin Moore; Moore's SSHP Latex Block Filler I60: Applied at a dry film thickness of not less than 8.0 mils.
b. Pittsburgh Paints; Speedhide Hi Fill Block Filler 6-15XI: Applied at a dry film thickness of not less than 8.2 mils.
c. Sherwin-Williams; Heavy Duty Block Filler B42W00150: Applied at a dry film thickness of not less than 8.0 mils.
2. Finish Coats:
a. Benjamin Moore; Moore's SSHP Acrylic Epoxy Coatings P43: Applied at a dry film thickness of not less than1.5 mils.
b. Pittsburgh Paints; Pitt-Glaze WB 1 Acrylic Pre-Cat Epoxy Semi-Gloss 16-1510 series: Applied at a dry film thickness of not less than 1.5 mils.
c. Sherwin-Williams; Pro Industrial Pre-Catalyzed Waterbased Epoxy K46 series Semi-Gloss: Applied at a dry film thickness of not less than 1.5 mils.

B. Interior Epoxy System over Gypsum Wall Board: Waterborne Epoxy.
1. Primer:
a. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer 253: Applied at a dry film thickness of not less than 1.2 mils.
b. Pittsburgh Paints; SEAL GRIP Int/Ext Acrylic Primer Sealer 17-921XI: Applied at a dry film thickness of not less than 1.8 mils.
c. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.1 mils.
2. Finish Coats:
a. Benjamin Moore; Moore's SSHP Acrylic Epoxy Coatings P43: Applied at a dry film thickness of not less than 1.5 mils.
b. Pittsburgh Paints; Pitt-Glaze WB 1 Acrylic Pre-Cat Epoxy Semi-Gloss, 16-1510 series: Applied at a dry film thickness of not less than 1.5 mils.
c. Sherwin-Williams; Pro Industrial Pre-Catalyzed Waterbased Epoxy K46 series Semi-Gloss: Applied at a dry film thickness of not less than 1.5 mils.

2.7 INTERIOR WOOD STAINS AND VARNISHES

A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.
   1. Benjamin Moore & Co.
   2. Minwax Stainable Wood Filler.

B. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.
   1. Benjamin Moore; Benwood IWF Penetrating Stain 234.
   2. Minwax 250 V.O.C. Compliant Wood Stain 7107/7108 Series.

C. Interior Waterborne Clear Satin Varnish: Factory-formulated clear satin acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.
   1. Benjamin Moore; Benwood Stays Clear Acrylic Polyurethane Low Lustre 423.
   2. Pittsburgh Paints; ProLuxe Interior Water-Based Acrylic Polyurethane, Satin; PLX259.
   3. Sherwin-Williams; Minwax Waterborne Polyurethane Satin, 710330000.

D. Interior Waterborne Clear Gloss Varnish: Factory-formulated clear gloss acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.
   1. Benjamin Moore; Benwood Stays Clear Acrylic Polyurethane High Gloss 422.
   2. Pittsburgh Paints; ProLuxe Interior Water-Based Acrylic Polyurethane, Gloss; PLX257.
   3. Sherwin-Williams; Minwax Waterborne Polyurethane Gloss, 710330000.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
   1. Concrete: 12 percent.
   2. Masonry (Clay and CMUs): 12 percent.
   3. Wood: 15 percent.
   4. Gypsum Board: 12 percent.
   5. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Plaster Substrates: Verify that plaster is fully cured.

E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
   1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
   1. SSPC-SP 2.
   2. SSPC-SP 3.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Wood Substrates:
   1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
   2. Sand surfaces that will be exposed to view, and dust off.
   3. Prime edges, ends, faces, undersides, and backsides of wood.
   4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

J. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 INSTALLATION

A. Apply paints according to manufacturer's written instructions.
   1. Use applicators and techniques suited for paint and substrate indicated.
   2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
   3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
   4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
   5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
   1. Paint the following work where exposed in occupied spaces:
      a. Equipment, including panelboards.
      b. Uninsulated metal piping.
      c. Uninsulated plastic piping.
      d. Pipe hangers and supports.
      e. Metal conduit.
      f. Plastic conduit.
      g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
      h. Other items as directed by Architect.
   2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
   1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
   2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
   3. Allow empty paint cans to dry before disposal.
   4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry (Other Than Concrete Unit Masonry): Provide the following paint systems over interior concrete and brick masonry substrates:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior concrete and masonry primer.
      b. Finish Coats: Interior semigloss acrylic enamel.
   2. Semigloss Waterborne Epoxy Finish: Two finish coats over a block filler.
      a. Primer: Interior concrete and masonry primer.
      b. Finish Coats: Waterborne acrylic epoxy.

B. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a block filler.
      a. Block Filler: Concrete unit masonry block filler.
      b. Finish Coats: Interior semigloss acrylic enamel.
   2. Semigloss Waterborne Epoxy Finish: Two finish coats over a block filler.
      a. Block Filler: Concrete unit masonry block filler.
      b. Finish Coats: Waterborne acrylic epoxy.

C. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
   1. Flat Acrylic Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior flat acrylic paint.
   2. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior low-luster acrylic enamel.
   3. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Interior semigloss acrylic enamel.
   4. Semigloss Waterborne Epoxy Finish: Two finish coats over a primer.
      a. Primer: Interior gypsum board primer.
      b. Finish Coats: Waterborne acrylic epoxy.

D. Plaster: Provide the following finish systems over interior gypsum board surfaces:
   1. Flat Acrylic Finish: Two finish coats over a primer.
      a. Primer: Interior plaster primer.
      b. Finish Coats: Interior flat acrylic paint.
   2. Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior plaster primer.
      b. Finish Coats: Interior low-luster acrylic enamel.
   3. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior plaster primer.
      b. Finish Coats: Interior semigloss acrylic enamel.
   4. Semigloss Waterborne Epoxy Finish: Two finish coats over a primer.
      a. Primer: Interior plaster primer.
      b. Finish Coats: Waterborne acrylic epoxy.

E. Ferrous Metal: Provide the following finish systems over ferrous metal:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior ferrous-metal primer.
      b. Finish Coats: Interior semigloss acrylic enamel.

F. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated metal surfaces:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior zinc-coated metal primer.
      b. Finish Coats: Interior semigloss acrylic enamel.

G. Overhead Structure, Deck, Mechanical, and Electrical Elements: Provide the following finish.
   1. Flat Acrylic Dryfall finish: Two finish coats factory primed surface.

H. All-Service Jacket over Insulation: Provide the following finish system on cotton or canvas insulation covering:
   1. Flat Acrylic Finish: Two finish coats. Add fungicidal agent to render fabric mildew proof.

a. Finish Coats: Interior flat latex-emulsion size.

3.7 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

A. Wood substrates, nontraffic surfaces, including wood trim, architectural woodwork, and wood-based panel products.
   1. Varnish over Stain System:
      a. Stain Coat: Stain for interior wood.
      b. First Intermediate Coat: Water-based varnish matching topcoat.
      c. Second Intermediate Coat: Water-based varnish matching topcoat.
      d. Topcoat: Varnish, water based, clear, satin.

END OF SECTION 09 91 23

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SECTION 09 93 30 - WOOD FLOOR REFURBISHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Repairing and patching of existing wood floors.
   2. Refinish of existing wood flooring.
      a. Sanding of existing floor.
      b. Moisture reading and recording.
      c. Ventilation drying of wood flooring.
      d. Applying finish coatings.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Include construction details, material descriptions, dimensions of individual components and profiles for wood flooring.
   2. Manufacturer's data on each type of finishing material with instructions for application.
   3. Submit Finish Manufacturer's recommended moisture content guidelines.

B. Submit moisture readings of floor materials to the Architect for record. Floor materials shall acclimate to readings below 12 percent prior to applying finishes.

C. Samples for Initial Selection: Manufacturer's color charts showing colors and glosses available for the following:
   1. Floor finish.

D. Samples for Verification:
   1. Include sample sets showing finishes applied to wood flooring similar to the existing wood floor.

E. Qualification Data: For Installer.

F. Maintenance Data: For wood floor finish systems to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced Installer who has completed wood flooring installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.
   1. Minimum of five years experience with wood floor repair, installation and refinishing, minimum of 5,000 square feet per job.
   2. Provide a list of jobs meeting minimum 5,000 square feet completed in the last five years, with name and telephone number of contact.

B. Materials shall be delivered to job in sealed containers. All work involved with sealing and finishing shall follow current Maple Flooring Manufacturer's Association Standards.

C. The Contractor shall be responsible for making all necessary field measurements and verifying all existing conditions.

D. All materials shall be applied by skilled mechanics.

E. Apply all materials evenly free from runs, crawls, sags or other defects. All materials shall be free of noticeable application marks such as brush or roller marks. Do not apply materials to damp surfaces or under any conditions unsuitable for production of good results. All materials shall be thoroughly mixed or agitated as required prior to and during application.

F. Finish shall be uniform in color, sheen and texture. All surfaces shall be covered evenly and completely. Edges cut in shall be clean and without overlapping.

G. All necessary equipment shall be provided including: Drop cloths in sufficient quantity to protect premises and equipment, wire brushes, steel wool, dusters, sandpaper, emery cloth, putty knives, trowels, sponges and pails.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Only materials such as required for the job shall be kept on the site as directed by the Owner. Oily rags shall be kept in covered containers.

B. Contractor to make good all damage from improper storage or handling of materials or equipment, and shall be responsible for his materials until completion and acceptance.

1.5 PROJECT CONDITIONS

A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after installation.
   1. Environmental Conditioning: Maintain an ambient temperature between 65 and 75 deg Fand relative humidity planned for building occupants, but not less than 35 percent or more than 50 percent, in spaces to receive wood flooring during the conditioning period.
   2. Wood Conditioning: Move wood components into spaces where they will be installed, no later than beginning of the conditioning period.
      a. Do not install wood flooring until wood components adjust to relative humidity of, and are at same temperature as, spaces where they are to be installed.
      b. Open sealed packages to allow wood components to acclimatize immediately on moving wood components into spaces in which they will be installed.

B. Refinish wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 FLOORING MATERIALS

A. Random-Length Strip Flooring: Northern hard maple (Acer saccharum), kiln dried, random length, tongue and groove, and end matched.
   1. Cut: Edge.
   2. Thickness: Match existing adjacent wood flooring.
   3. Face Width: Match existing adjacent wood flooring.

2.2 FLOOR FINISH MATERIALS

A. Urethane Finish System: Complete water-based system of compatible components that is recommended by finish manufacturer for application indicated.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Basic Coatings, Inc.
      b. BonaKemi USA Inc.
      c. DuraSeal.
      d. Hillyard, Inc.
      e. PoloPlaz.
   2. VOC Content: When calculated according to 40 CFR 59, Subpart D (EPA Method 24), as follows:
      a. Finish Coats and Floor Sealers: Not more than 350 g/L.
      b. Stains: Not more than 250 g/L.
   3. Stain: Penetrating and nonfading type.
      a. Color: As selected by Architect from manufacturer's full range.
   4. Floor Sealer: Pliable, penetrating type.
   5. Finish Coats: Formulated for multicoat application on wood flooring.

2.3 ACCESSORIES

A. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines: Wood Flooring.".

B. Adhesives: Manufacturer's standard for application indicated that has a VOC content of 100 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions, with installer/applicator present, for compliance with requirements for maximum moisture content, and other conditions affecting performance of wood flooring and finish.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring.".

B. Solid-Wood Flooring: Blind nail flooring to substrate.
   1. For flooring of face width more than 3 inches:
      a. Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.

3.4 APPLICATION

A. Follow applicable recommendations in MFMA's "Industry Recommendations for Sanding, Sealing, Finishing, and Resurfacing of Maple Gym Floors."

B. Remove and salvage base or shoe mold prior to refinishing. Reinstall base and or shoe mold after floor is finished.

C. Remove all equipment anchors in the floor prior to refinishing. Replace anchors after floor is finished.

D. Record moisture content of wood floor.
   1. Provide readings before stripping, after traversing, and before applying finishes.

E. All wood floors shall be sanded with a heavy power driven sander. For the first cut, the floor shall be traversed in both directions going with the grain of the flooring using #2 ½ sandpaper. Follow with #1 ½ paper, then with #1/2, finishing with #00. All cuts should be made with the grain and rough or finish sanding on the diagonal will not be permitted without specific permission of the Architect. Particular attention should be given on each finishing cut to completely remove the coarser grit marks from the preceding cut. Sanding machine shall not be moved more than two boards at a time

for each traverse on any of the four cuts. After sanding, contractor shall thoroughly vacuum floor with a heavy duty commercial type vacuum. After sanding floor shall be free of drum stop marks, edger marks, or other uneveness as a result of sanding operations.

F. After sanding, floor shall be thoroughly vacuumed and swept with a tack rag (turkish towel wrung out in solvent approved by the finish manufacturer) until no traces of powder remain on floor. With a clean finish applicator, apply a liberal coat in a uniform manner in accordance with finish manufacturer's recommendations. Follow finish manufacturer's recommendations for intercoat abrasion and cleaning.

G. Finish: Apply seal and finish coats of finish system according to finish manufacturer's written instructions. Provide no fewer than four coats total and no fewer than two finish coats.

H. Apply finishes in accordance with the manufacturer's application directions, and as follows:
   1. After final coat do not use floor for at least 7 days. Avoid heavy traffic for at least two weeks.
   2. During finishing and drying time, floor must be free of dust and dirt. Avoid air currents that carry dust and dirt. Temperature of room and materials shall be 70 or above. Allow adequate ventilation for proper curing.
   3. Air handlers shall not be operated during finish curing periods.
   4. Increase finish curing times per manufacturer recommendations if relative ambient humidity exceeds manufacturer's guidelines.

3.5 CLEANING

A. Just prior to substantial completion, remove protective coverings, and remove all traces of dust and dirt.

3.6 DEMONSTRATION

A. Instruct the Owner in proper care of floors and in use of floor care products.

3.7 PROTECTION

A. Protect flooring from moisture at all times.

B. Field Finished Floors:
   1. Do not permit traffic on floor after sanding and before completion of finish system, except for installers applying finishes.
   2. Cover sanded floor with building paper to provide access for application of first finish coats.

C. Protect floors during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Substantial Completion.
   1. Cover completed flooring until substantial completion with heavy kraft paper or other material capable of fully protecting flooring and finish.
   2. Do not cover floors after finishing until finish reaches full cure, and not before seven days after applying last finish coat.
   3. Do not move heavy and sharp objects directly over sports floors. Protect fully cured floor finishes and surfaces with plywood or hardboard panels to prevent damage from storing or moving objects over sports floors.

D. Prohibit nonessential traffic on completed floors.

END OF SECTION 09 93 30

SECTION 09 96 00 – HIGH PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and field application of high-performance coating systems to items and surfaces scheduled.
   1. Steel.

1.3 DEFINITIONS

A. Standard coating terms defined in ASTM D 16 apply to this Section.

1.4 SUBMITTALS

A. Product Data: For each coating system indicated. Include block fillers and primers.
   1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
   2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material specified.

B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.
   1. After color selection, Architect will furnish color chips for surfaces to be coated.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Provide mockup of precast concrete surface to represent surfaces and conditions for application of coating system.
      a. Provide samples of at least 40 sq. ft.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Source Limitations: Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:
1. Name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Application instructions.
6. Color name and number.
7. Handling instructions and precautions.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.7 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 45 and 95 deg F.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.
2. Work may continue during inclement weather only if areas and surfaces to be coated are enclosed and temperature within the area can be maintained within limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated in the coating system descriptions.

B. Manufacturers' Names: The following manufacturers are referred to in the coating system descriptions by shortened versions of their names shown in parenthesis:
1. PPG Industries (PPG).
2. Sherwin-Williams Company (Sherwin-Williams).

3. Tnemec Company, Inc. (Tnemec).

2.2 COATINGS MATERIALS, GENERAL

A. Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's highest grade of the various high-performance coatings specified. Materials not displaying manufacturer's product identification are not acceptable.

2.3 COLORS

A. Colors: As selected by Architect from manufacturer's full range.
1. Custom color matching will be required.

2.4 HIGH-PERFORMANCE COATING SYSTEMS

A. Provide the following finish systems :
1. One finish coat over an intermediate coat and a primer.
a. Primer: Epoxy primer applied at spreading rate recommended by manufacturer.
1) PPG; 95-245 Pitt-Guard Rapid Coat Direct to Rust Epoxy Mastic.
2) Sherwin-Williams; Macropoxy 646 Fast Cure Epoxy.
3) Tnemec; Series V27 FC Typoxy Polyamide Epoxy.
b. Intermediate Coat: Epoxy applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 3.0 to 8.0 mils.
1) PPG; 95-245 Pitt-Guard Rapid Coat Direct to Rust Epoxy Mastic.
2) Sherwin-Williams; Macropoxy 646 Fast Cure Epoxy.
3) Tnemec; Series N69 HI-Build Epoxoline II Polyamidoamine Epoxy.
c. Topcoat: Aliphatic polyurethane enamel applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 1.5 to 4.0 mils.
1) PPG; 95-812 Pitthane Ultra Gloss Urethane Enamels.
2) Sherwin-Williams; Acrolon 218 HS Semi-Gloss Polyurethane.
3) Tnemec; Series 1075 Endura-Shield II Aliphatic Acrylic Polyurethane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. With Applicator present, examine substrates and conditions under which high-performance coatings will be applied, for compliance with coating application requirements.
1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.

2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.

B. Coordination of Work: Review other Sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.
   1. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
      a. Confirmation of primer's suitability for expected service conditions.
      b. Confirmation of primer's ability to be top coated with materials specified.

3.2 Notify Architect about anticipated problems before using the coatings specified over substrates primed by others.PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.

B. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
   1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.

C. Cleaning: Before applying high-performance coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.
   1. Schedule cleaning and coating application so dust and other contaminates from cleaning process will not fall on wet, newly coated surfaces.

D. Surface Preparation: Clean and prepare surfaces to be coated according to manufacturer's written instructions for each substrate condition and as specified.
   1. Provide barrier coats over incompatible primers/paints or remove primers/paints and reprime substrate.

E. Ferrous-Metal Substrates: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
   1. Blast-clean steel surfaces as recommended by coating manufacturer and according to SSPC-SP 10/NACE No. 2.
   2. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   3. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, solvent clean, and touch up with same primer as the shop coat.

F. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk.

1. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

G. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
   1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
   2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
   3. Use only the type of thinners approved by manufacturer and only within recommended limits.

H. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply high-performance coatings according to manufacturer's written instructions.
   1. Use applicators and techniques best suited for the material being applied.
   2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
   3. Coating colors, surface treatments, and finishes are indicated in the coating system descriptions.
   4. Provide finish coats compatible with primers used.
   5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
      a. Coat surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
      b. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.
   1. The number of coats and film thickness required is the same regardless of application method.
      a. Omit primer on metal surfaces that have been shop primed and touchup painted.
      b. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.

c. Where manufacturer's written instructions require sanding, sand between applications to produce a smooth, even surface.
d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause undercoat to lift or lose adhesion.

2. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.

C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brush Application: Use brushes best suited for material applied and of appropriate size for the surface or item being coated.
a. Apply primers and first coats by brush unless manufacturer's written instructions permit using roller or mechanical applicators.
b. Brush out and work brush coats into surfaces in an even film.
c. Eliminate cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Neatly draw glass lines and color breaks.
2. Spray Equipment: Use mechanical methods to apply coating if permitted by manufacturer's written instructions and governing regulations.
a. Use spray equipment with orifice size recommended by manufacturer for material and texture required.
b. Apply each coat to provide the equivalent hiding of brush-applied coats.
c. Do not double back with spray equipment building-up film thickness of two coats in one pass, unless recommended by manufacturer.

D. Minimum Coating Thickness: Apply each material no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by manufacturer, to material required to be coated or finished that has not been prime coated by others.
1. Recoat primed and sealed substrates if there is evidence of suction spots or unsealed areas in first coat, to ensure a finish coat with no burn-through or other defects caused by insufficient sealing.

F. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 CLEANING

A. Cleanup: At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
   1. Provide "Wet Paint" signs to protect newly coated finishes. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.
   2. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces. Comply with procedures specified in PDCA P1.

END OF SECTION 09 96 00

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SECTION 09 96 53 - ELASTOMERIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Elastomeric coatings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Indicate VOC content.

B. Samples for Initial Selection: For each type of elastomeric coating.

C. Samples for Verification: For each type of elastomeric coating indicated and in each color and gloss.
   1. Submit Samples on same type of substrate as that to receive application, 8 inches square.
   2. Apply coats on Samples in steps to show each separate coat, including primers and block fillers as applicable.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.

D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Quantity: Furnish not less than 1 gal. of each material, color, and texture applied.

1.4 MOCKUPS

A. Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 90 deg F unless otherwise permitted by manufacturer's written instructions.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace elastomeric coatings that fail within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Water penetration through the coating.
b. Deterioration of coating beyond normal weathering.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ELASTOMERIC COATINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. Dow Chemical Company.
2. Pittsburgh Paints Co.
3. Sherwin-Williams Company.

B. Product/Manufacturer: Basis of design.
   1. Dowsil AllGuard Silicone Elastomeric Coating; Dow Chemical Company.

C. Material Compatibility:
   1. Materials for use within each paint system are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, products are recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

D. Colors: As selected by Architect from manufacturer's full range.

E. Crack Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated.

F. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

G. Concrete Unit Masonry Block Filler: Elastomeric coating manufacturer's recommended, factory-formulated, high-performance latex block filler compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for maximum moisture content, alkalinity, and other conditions affecting performance of work.

B. Begin coating only when moisture content of substrate is 12 percent or less when measured with an electronic moisture meter.

C. Begin coating no sooner than 28 days after substrate is constructed and is visually dry on both sides.

D. Verify that substrate is within the range of alkalinity recommended by manufacturer.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.

B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
   1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
   2. Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

D. Crack Repair: Fill cracks in accordance with manufacturer's written instructions before coating surfaces.

3.3 APPLICATION OF ELASTOMERIC COATINGS

A. Apply elastomeric coatings in accordance with manufacturer's written instructions.
   1. Use equipment and techniques best suited for substrate and type of material being applied.
   2. Coat surfaces behind movable items the same as similar exposed surfaces.
   3. Apply each coat separately in accordance with manufacturer's written instructions.

B. Primers: Apply at a rate to ensure complete coverage.

C. Block Fillers: Apply at a rate to ensure complete coverage with pores filled.

D. Elastomeric Finish Coat(s): Provide a minimum of two coats of not less than 20 mil total wet film thickness (10 mil wet film thickness per coat) to provide finished dry film thickness of not less than 10 mils.

E. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats similar to color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

F. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.

G. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

H. Apply coatings to prepared surfaces as soon as practicable after preparation and before subsequent surface soiling or deterioration.

I. Spray Application: Use spray equipment for application only when permitted by authorities having jurisdiction. Wherever spray application is used, do not double back with spray equipment to build up film thickness of two coats in one pass.

3.4 FIELD QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following testing procedures:
   1. Owner will engage the services of a qualified testing agency to sample materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
   2. Testing agency will perform tests for compliance of materials with product requirements.
   3. Owner may direct Contractor to stop coating application if test results show materials being used do not comply with requirements. Remove noncomplying materials from Project site, pay for testing, and recoat surfaces that were coated with rejected materials. Remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

B. Field Testing and Inspection: Owner reserves the right to engage the services of a qualified testing agency to verify installed thickness of elastomeric coatings.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities, touch up and restore damaged or defaced coated surfaces.

END OF SECTION 09 96 53

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SECTION 10 11 00 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Glass markerboards.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.
2. Include electrical characteristics for motorized units.

B. Shop Drawings: For visual display units.
1. Include plans, elevations, sections, details, and attachment to other work.

C. Samples for Verification: For each type of visual display unit indicated.
1. Visual Display Panel: Not less than 8-1/2 by 11 inches. Include one panel for each type, color, and texture required.

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranties: For manufacturer's special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For visual display units to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining

ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 GLASS MARKERBOARDS

A. Basis-of-Design: Subject to compliance with requirements, provide Clarus Glass Whiteboards, other available manufacturers offering acceptable equivalent products that may be incorporated into the Work include, but are not limited to, the following:
   1. ReMarkable Glass by GlasPro.
   2. Egan Visual – GlassWrite.
   3. Claridge Glass Whiteboard.

B. Glass Markerboards: Fabricated of 6-mm tempered low-iron glass with steel backing for use with magnets.
   1. Edge Treatment: Smooth polished edge with rounded corners.
   2. Frame: Aluminum trim in profile indicated.
   3. Surface: Glossy.
   4. Color: White.

C. Mounting: Concealed.

D. Marker Tray: Aluminum, attached with magnet.

2.2 MATERIALS

A. Clear Tempered Glass: ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering.

B. Extruded Aluminum: ASTM B221, Alloy 6063.

2.3 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine walls and partitions for proper preparation and backing for visual display units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.

C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.

3.3 INSTALLATION

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.4 CLEANING AND PROTECTION

A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.

B. Cover and protect visual display units after installation and cleaning.

END OF SECTION 10 11 00

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SECTION 10 14 16 - PLAQUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal plaques.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plaques.
   1. Include fabrication and installation details and attachments to other work.
   2. Show plaque mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, and layout for each plaque at least half size.

C. Samples for Initial Selection: For each type of plaque, exposed component, and exposed finish.
   1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of plaque showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
   1. Plaques: Half-size Sample.

E. Product Schedule: For plaques. Use same designations indicated on Drawings or specified.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For plaques to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of finishes beyond normal weathering.
      b. Deterioration of embedded graphic image.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 2/90 Sign Systems.
   2. APCO Signs.
   3. Gemini Inc.
   4. Takeform.

2.2 METAL PLAQUES

A. Etched Plaque (SIGN-1): Chemically etched or photochemically engraved metal sheet or plate with texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Plaque Material: Sheet or plate bronze.
   3. Plaque Thickness: 0.250 inch.
   4. Finishes:
      a. Integral Metal Finish: As selected by Architect from full range of industry finishes.
      b. Overcoat: Manufacturer's standard baked-on clear coating.
   5. Mounting: As indicated on Drawings.

2.3 MATERIALS

A. Bronze Castings: ASTM B584, alloy recommended by manufacturer and finisher for finish indicated.

B. Bronze Plate: ASTM B36/B36M, alloy recommended by manufacturer and finisher for finish indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. Plaque Mounting Fasteners:
      a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.

2.5 FABRICATION

A. General: Provide manufacturer's standard plaques according to requirements indicated.
   1. Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
   2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
   4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   5. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.

B. Surface-Engraved Graphics: Machine-engrave characters and other graphic devices into indicated plaque surface to produce precisely formed copy, incised to uniform depth.
   1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

2.7 LACQUER COATING FOR COPPER-ALLOY FINISHES

A. Lacquer Coating: Clear, organic, waterborne, air-drying, acrylic lacquer called "Incralac"; specially developed for coating copper-alloy products; consisting of a solution of acrylic resin, methyl methacrylate copolymer, leveling agent, and corrosion inhibitor benzotriazole.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL PLAQUES

A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
   1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
   2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
   3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
   4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:
   1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
      a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.
      b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as plaques are installed.

C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 16

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SECTION 10 14 19 - DIMENSIONAL LETTER SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Dimensional characters.
      a. Cutout dimensional characters.
      b. Illuminated, fabricated channel dimensional characters.

1.2 DEFINITIONS

A. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

1.3 COORDINATION

A. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For signs.
   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, and layout for each sign at least half size.
   4. Show locations of electrical service connections.
   5. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
   1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
   1. Dimensional Characters: Full-size Sample of each type of dimensional character.

E. Product Schedule: For dimensional letter signs. Use same designations indicated on Drawings or specified.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify locations of electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of finishes beyond normal weathering.
      b. Separation or delamination of sheet materials and components.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 2/90 Sign Systems.
   2. APCO Signs.
   3. Gemini Inc.
   4. Takeform.

2.3 DIMENSIONAL CHARACTERS

A. Cutout Characters (SIGN-2): Characters with uniform faces; square-cut, smooth edges; precisely formed lines and profiles; and as follows:
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Character Material: Sheet or plate acrylic.
   3. Character Height: As indicated on Drawings.
   4. Thickness: As indicated on Drawings.
   5. Finishes:

a. Acrylic Color: As selected by Architect from full range of industry colors.

6. Mounting: Concealed studs.

B. Fabricated Channel Characters (SIGN-3): Metal face and side returns, formed free from warp and distortion; with uniform faces, sharp corners, and precisely formed lines and profiles; internally braced for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners; and as follows.

1. Product/Manufacturer: Basis of design.
   a. As indicated on Drawings.
2. Illuminated Characters: Backlighted character construction with LED lighting, including transformers, insulators, and other accessories for operability, with provision for servicing and concealing connections to building electrical system. Use tight or sealed joint construction to prevent unintentional light leakage. Space lamps apart from each other and away from character surfaces as needed to illuminate evenly.
   a. Power: As indicated on electrical Drawings.
3. Character Material: Sheet or plate aluminum.
4. Material Thickness: Manufacturer's standard for size and design of character.
5. Translucent Sheet: Acrylic sheet with integral color as selected by Architect from manufacturer's full range.
   a. Sheet Thickness: Manufacturer's standard thickness for size of character.
6. Character Height: As indicated on Drawings.
7. Character Depth: As indicated on Drawings.
8. Finishes:
   a. Integral Aluminum Finish: Anodized color as selected by Architect from full range of industry colors and color densities.
9. Mounting: Manufacturer's standard for size and design of character.

2.4 DIMENSIONAL CHARACTER MATERIALS

A. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.5 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.

2.6 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
   1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
   2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
   4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   5. Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
   6. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
   7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.7 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.8 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that electrical service is correctly sized and located to accommodate signs.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF DIMENSIONAL CHARACTERS

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
   1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
   3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:
   1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
      a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
      b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.
   2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
      a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
      b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 19

SECTION 10 14 19.13 - VINYL WALL DECALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface applied vinyl wall decals.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
1. Include fabrication and installation details and attachments to other work.
2. Show decal size and mounting heights.
3. Show message list, typestyles, graphic elements, and layout for each decal.

C. Samples for Initial Selection: For each type of decals assembly, exposed component, and exposed finish.
1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of decal showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
1. Vinyl Wall Decal: Full-size Sample.

E. Product Schedule: Use same designations indicated on Drawings or specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For decals to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify locations of applied vinyl wall decal applied to permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to replace decals that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of finishes beyond normal weathering.
      b. Separation or delamination from substrate of sheet materials.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. 3M.
   2. Avery.
   3. Arlon.
   4. Orafol (oracal).

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

2.2 MATERIALS

A. Field-Applied, Vinyl Wall Decals: Characters die cut from 2-mil thick, weather-resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application.
   1. Size: As indicated on Drawings.
   2. Substrate: As indicated on Drawings.
   3. Text and Font: As indicated on Drawings.

2.3 ACCESSORIES

A. Adhesive: As recommended by decal manufacturer and compatible with substrate indicated.

2.4 FABRICATION

A. General: Provide manufacturer's assemblies according to requirements indicated.

B. Surface Applied Vinyl Graphics: Product die cut to precisely formed images as indicated on Drawings. Image shall be free of rough edges.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install decals using mounting methods indicated and according to manufacturer's written instructions.
   1. Install decals level, plumb, true to line, and at locations and heights indicated, with decal surfaces free of distortion and other defects in appearance.
   2. Before installation, verify that surfaces are clean and free of materials or debris that would impair installation.

B. Mounting Methods:
   1. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Keep adhesive away from edges to prevent adhesive extrusion as decal is applied and to prevent visibility of cured adhesive at decal edges. Place decal in position, and push to engage adhesive.
   2. Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

3.2 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed decals and decals that do not comply with specified requirements. Replace decals with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings.

C. On completion of installation, clean exposed surfaces of decals according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain decals in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 19.13

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SECTION 10 14 23.16 - ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes room-identification signs that are directly attached to the building.

1.2 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For room-identification signs.
   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
   1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
   1. Room-Identification Signs: Full-size Sample.
   2. Variable Component Materials: Full-size Sample of each base material, character (letter, number, and graphic element) in each exposed color and finish not included in Samples above.
   3. Exposed Accessories: Full-size Sample of each accessory type.

E. Product Schedule: For room-identification signs. Use same designations indicated on Drawings or specified.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of finishes beyond normal weathering.
      b. Deterioration of embedded graphic image.
      c. Separation or delamination of sheet materials and components.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. 2/90 Sign Systems.
   2. APCO Signs.
   3. Gemini Inc.
   4. Takeform.

2.3 ROOM-IDENTIFICATION SIGNS

A. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

2.4 SIGN MATERIALS

A. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

B. Vinyl Film: UV-resistant vinyl film with pressure-sensitive, permanent adhesive; die cut to form characters or images as indicated on Drawings.

C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.5 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:
   1. Use concealed fasteners and anchors unless indicated to be exposed.

2.6 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
   1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
   2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   4. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

2.7 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
   1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Install signs so they do not protrude or obstruct according to the accessibility standard.
   3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Accessibility: Install signs in locations on walls according to the accessibility standard.

3.2 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 23.16

SECTION 10 14 73 - PAINTED SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall-identification signs for fire and smoke assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For painted signs.
   1. Show sign locations and mounting heights.
   2. Show message list, typestyles, graphic elements, and layout for each sign at least half size.

1.3 QUALITY ASSURANCE

A. Mockups: Prepare mockups of painted signs for each type of sign material and substrate indicated and each color and finish required to demonstrate aesthetic effects and to set quality standards for materials and execution. Duplicate appearance of approved Sample submittals.
   1. Locate mockups in locations that enable viewing under same conditions as the completed Work.
   2. Sign Mockups: Two sign texts that represent surfaces and conditions for signage application under same conditions as the completed Work.
   3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

PART 2 - PRODUCTS

2.1 PAINTED SIGNS

A. Wall-Identification Sign: Sign applied directly on indicated substrate to identify fire and smoke assemblies, including preparatory treatment as required.
   1. Sign Material: Stenciled-on latex paint or preprinted, self-adhesive decals.
   2. Font: Minimum 3 inches high characters in a contrasting color, with minimum 0.375-inch wide strokes.

3. Text: "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS."

2.2 PAINT MATERIALS

A. Sign Paints and Coatings: Inks, dyes, and paints that are recommended in writing by manufacturer for optimum adherence to substrate and are UV and water resistant for colors and exposure indicated.
   1. Compatibility: Provide paint materials that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance. Comply with paint manufacturer's written instructions for inspection.

B. If existing surfaces cannot be prepared to an acceptable condition for proper painting, notify Architect in writing.

C. Proceed with installation only after unsatisfactory conditions have been corrected and surface is dry.
   1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

A. Comply with manufacturers' written instructions for surface preparation and paint-application for each substrate condition.

B. Apply primers, sealers, undercoats, and transition coats so that they do not extend beyond the limits of the painted signage. Remove excess without damaging the substrate.

C. Install signs level, plumb, true to line, with uniform delineation and borders, and at locations and heights indicated.
   1. Prespaced characters with template, cutout stencil, or ruler and straightedge.

3.3 MARKING FIRE AND SMOKE ASSEMBLIES

A. Wall-Identification Signs: Permanently identify both sides of each fire and smoke assembly indicated on Drawings. Place signs in accessible, concealed floor, floor-ceiling, or attic space at maximum 15 feet from end of wall and at maximum intervals of 30 feet, measured horizontally along the assembly. Locate signs for greatest visibility in the space.

3.4 ADJUSTING AND CLEANING

A. Remove and reapply damaged or deformed signs and signs that do not comply with specified requirements. Reapply signs with damaged or deteriorated finishes that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. After completing sign application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

END OF SECTION 10 14 73

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SECTION 10 21 13.17 - PHENOLIC-CORE TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Phenolic-core toilet compartments.

1.2 COORDINATION

A. Coordinate requirements for overhead supports, blocking, reinforcing, and other supports concealed within wall and ceiling to ensure that toilet compartments can be supported and installed as indicated.

1.3 ACTION SUBMITTALS

A. Product Data.
   1. Phenolic-core toilet compartments.
      a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.

B. Shop Drawings:
   1. Include plans, elevations, sections, details, and attachment details.
   2. Show locations of cutouts for compartment-mounted toilet accessories.
   3. Show locations of centerlines of toilet fixtures.
   4. Show locations of floor drains.
   5. Show ceiling grid, ceiling-mounted items, and overhead support or bracing locations.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of toilet compartment.
   1. Include Samples of hardware and accessories involving material and color selection.

D. Samples for Verification: Actual sample of finished products for each type of toilet compartment, hardware, and accessory.
   1. Size: Manufacturers' standard size.

E. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For toilet compartments.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Materials: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Door Hinges: Six hinge(s) with associated fasteners.
   2. Latch and Keeper: Four latch(es) and keeper(s) with associated fasteners.
   3. Door Bumper: Four door bumper(s) with associated fasteners.
   4. Door Pull: Four door pull(s) with associated fasteners.
   5. Fasteners: 25 fasteners of each size and type.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements, and coordinate before fabrication.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain phenolic-core toilet compartments from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 450 or less.

B. Structural Performance: Where grab bars are mounted on toilet compartments, design panels to comply with the following requirements:
   1. Panels are able to withstand a concentrated load on grab bar of at least 250 lbf applied at any direction and at any point, without deformation of panel.

C. Regulatory Requirements: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for toilet compartments designated as accessible.

2.3 PHENOLIC-CORE TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. ASI Global Partitions.
   2. Bradley Corp.
   3. Hadrian.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

C. Toilet-Enclosure Style: Overhead braced.

D. Urinal-Screen Style: Post to ceiling.

E. Door, Panel, and Pilaster Construction: Solid phenolic-core material with melamine facing on both sides fused to substrate during manufacture (not separately laminated), and with eased and polished edges. Provide minimum 3/4-inch- thick doors and pilasters and minimum 1/2-inch- thick panels.

F. Urinal-Screen Construction: Matching panel construction.

G. Pilaster Shoes: Formed from stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.

H. Urinal-Screen Post: Manufacturer's standard post design of 1-3/4-inch- square, aluminum tube with satin finish; with shoe and sleeve (cap) matching that on the pilaster.

I. Brackets (Fittings):
   1. Full-Height (Continuous) Type: Manufacturer's standard design, stainless steel.

J. Phenolic Compartment Finish:
   1. Dark-Core Phenolic: Manufacturer's standard dark color core and edge.
      a. Facing Sheet Color: As indicated on Drawings.

2.4 HARDWARE AND ACCESSORIES

A. Door Hardware and Accessories, Heavy Duty: Manufacturer's heavy-duty institutional operating hardware and accessories.
   1. Hinges: Manufacturer's minimum 0.062-inch- thick, stainless steel surface-mounted, paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door. Mount with through bolts.
   2. Latch and Keeper: Manufacturer's heavy-duty, surface-mounted, cast stainless steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at toilet enclosures designated as accessible. Mount with through bolts.
   3. Coat Hook: Manufacturer's heavy-duty, combination cast stainless steel hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories. Mount with through bolts.
   4. Door Bumper: Manufacturer's heavy-duty, rubber-tipped, cast stainless steel bumper at outswinging doors. Mount with through bolts.
   5. Door Pull: Manufacturer's heavy-duty, cast stainless steel pull at outswinging doors that complies with regulatory requirements for accessibility. Provide units

on both sides of doors at toilet enclosures designated as accessible. Mount with through bolts.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.5 MATERIALS

A. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

B. Stainless Steel Castings: ASTM A743/A743M.

2.6 FABRICATION

A. Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters and walls to suit floor and wall conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Urinal-Screen Posts: Manufacturer's standard corrosion-resistant anchoring assemblies at posts and walls, with leveling adjustment nuts at[**tops and**] bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.

D. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, inswinging doors for standard toilet enclosures and 36-inch- wide, outswinging doors with a minimum 32-inch- wide, clear opening for toilet enclosures designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
   1. Confirm location and adequacy of blocking and supports required for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
   1. Maximum Clearances:
      a. Pilasters and Panels or Screens: 1/2 inch.
      b. Panels or Screens and Walls: 1 inch.
   2. Full-Height (Continuous) Brackets: Secure panels or screens to walls and to pilasters with full-height brackets.
      a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
      b. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware in accordance with hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 10 21 13.17

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SECTION 10 22 13 - WIRE MESH PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standard-duty wire mesh partitions.

1.2 DEFINITIONS

A. Intermediate Crimp: Wires pass over one and under the next adjacent wire in both directions, with wires crimped before weaving and with extra crimps between the intersections.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Wire mesh partitions.

B. Shop Drawings:
   1. Include plans, elevations, sections, and attachment details.
   2. Indicate clearances required for operation of doors and gates.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for units with factory-applied color finishes.

1.4 INFORMATIONAL SUBMITTALS

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wire mesh partition hardware.

1.6 QUALITY ASSURANCE

A. Qualifications:
   1. Installers: Entity that employs installers and supervisors who are trained and approved by manufacturer.
   2. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
      a. AWS D1.1/D1.1M.
      b. AWS D1.3/D1.3M.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire mesh items with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Use vented plastic.

B. Inventory wire mesh partition door hardware on receipt, and provide secure lockup for wire mesh partition door hardware delivered to Project site.
   1. Tag each item or package separately with identification, and include basic installation instructions with each item or package.

C. Deliver keys to Owner by registered mail or overnight package service.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Acorn Wire & Iron Works.
   2. Indiana Wire Products, Inc.
   3. King Wire Partitions, Inc.

2.2 SOURCE LIMITATIONS

A. For wire mesh products, obtain each color, grade, finish, type, and variety from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Wire mesh units to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
   1. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft. at any location on a panel.
   2. Concentrated load and total load need not be assumed to act concurrently.

B. Regulatory Requirements: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC A117.1 for doors and gates designated as accessible.

2.4 STANDARD-DUTY WIRE MESH PARTITIONS

A. Mesh: 0.135-inch- diameter, intermediate-crimp steel wire woven into 1-1/2-inch diamond mesh.

B. Vertical Panel Framing: 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels with holes for 1/4-inch- diameter bolts not more than 12 inches o.c.

C. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels.

D. Horizontal Panel Stiffeners: Two cold-rolled steel channels, 3/4 by 3/8 by 1/8 inch, bolted or riveted toe to toe through mesh; or one 1-by-1/2-by-1/8-inch cold-rolled steel channel with wire mesh woven through channel.

E. Top Capping Bars: 2-1/4-by-1-inch cold-rolled steel channels.

F. Posts for 90-Degree Corners: 1-1/4-by-1-1/4-by-1/8-inch steel angles or square tubes with holes for 1/4-inch- diameter bolts aligning with bolt holes in vertical framing; with floor anchor clips.

G. Adjustable Corner Posts: Two 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels connected by steel hinges at 36 inches o.c., with holes for 1/4-inch- diameter bolts aligning with bolt holes in vertical framing.

H. Line Posts: 3-inch-by-4.1-lb or 3-1/2-by-1-1/4-by-0.127-inch steel channels; with 1/4-inch steel base plates.

I. Three-Way Intersection Posts: 1-1/4-by-1-1/4-by-1/8-inch steel tubes or channels, with holes for 1/4-inch- diameter bolts aligned for bolting to adjacent panels.

J. Four-Way Intersection Posts: 1-1/4-by-1-1/4-by-1/8-inch steel tubes, with holes for 1/4-inch- diameter bolts aligned for bolting to adjacent panels.

K. Floor Shoes: Metal, not less than 2-1/2 inches high; sized to suit vertical framing, drilled for attachment to floor, and with setscrews for leveling adjustment.

L. Sliding Doors: Fabricated from same mesh as partitions, with framing fabricated from 1-1/2-by-3/4-by-1/8-inch steel channels, banded with 1-1/2-by-1/8-inch flat steel bar cover plates on four sides.
   1. Hardware: Two, four-wheel roller-bearing carriers; box track; and bottom guide channel for each door.
   2. Cylinder Lock: Mortise type with cylinder specified in Section 08 71 00 "Door Hardware"; operated by key outside and recessed turn knob inside.

M. Accessories:
   1. Sheet Metal Base: 0.060-inch- thick, steel sheet.
   2. Adjustable Filler Panels: 0.060-inch- thick, steel sheet; capable of filling openings from 2 to 12 inches.
   3. Wall Clips: Manufacturer's standard, steel sheet; allowing up to 1 inch of adjustment.

N. Finish: Powder-coated finish unless otherwise indicated.
   1. Color: As selected by Architect from manufacturer's full range.

2.5 MATERIALS

A. Steel Wire: ASTM A510/A510M.

B. Steel Plates, Channels, Angles, and Bars: ASTM A36/A36M.

C. Steel Sheet: Cold-rolled steel sheet, ASTM A1008/A1008M, Commercial Steel (CS), Type B.

D. Steel Pipe: ASTM A53/A53M, Schedule 40, unless another weight is indicated or required by structural loads.

E. Steel Tubing: ASTM A500/A500M, cold-formed structural-steel tubing or ASTM A513/A513M, Type 5, mandrel-drawn mechanical tubing.

F. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.

G. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
   1. Material for Interior Locations: Carbon-steel components are zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.6 FABRICATION

A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-sized components as recommended by wire mesh item manufacturer. Furnish bolts, hardware, and accessories required for complete installation with manufacturer's standard finishes.
   1. Fabricate wire mesh items to be readily disassembled.
   2. Welding: Weld corner joints of framing and grind smooth, leaving no evidence of joint.

B. Standard- Duty Wire Mesh Partitions: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of cutouts to provide a neat, protective edge.
   1. Mesh: Securely clinch mesh to framing.
   2. Framing: Fabricate framing with mortise-and-tenon corner construction.
      a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommended by wire mesh partition manufacturer. Weld horizontal stiffeners to vertical framing.
      b. Fabricate three- and four-way intersections using intersection posts.
      c. Fabricate partition and door framing with slotted holes for connecting adjacent panels.
   3. Fabricate wire mesh partitions with 3 to 4 inches of clear space between finished floor and bottom horizontal framing.

4. Doors: Align bottom of door with bottom of adjacent panels.
   a. For doors that do not extend full height of partition, provide transom over door, fabricated from same mesh and framing as partition panels.
5. Hardware Preparation: Mortise, reinforce, drill, and tap doors and framing as required to install hardware.

2.7 STEEL AND IRON FINISHES

A. Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on powder-coat finish, suitable for use indicated, with a minimum dry film thickness of 2 mils.
   1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine floors for suitable conditions where wire mesh items will be installed.

C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF WIRE MESH PARTITIONS

A. Anchor wire mesh partitions to floor with 3/8-inch- diameter, postinstalled expansion anchors at 12 inches o.c. through floor shoes located at each post and corner. Adjust wire mesh partition posts in floor shoes to achieve level and plumb installation.

B. Anchor wire mesh partitions to walls at 12 inches o.c. through back corner panel framing and as follows:
   1. For concrete and solid masonry anchorage, use expansion anchors.
   2. For hollow masonry anchorage, use toggle bolts.
   3. For steel-framed gypsum board assemblies, use lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
   4. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

C. Secure top capping bars to top framing channels with 1/4-inch- diameter, "U" bolts spaced not more than 28 inches o.c.

D. Provide line posts at locations indicated or, if not indicated, as follows:
   1. On each side of sliding-door openings.

E. Where standard-width wire mesh partition panels do not fill entire length of run, provide adjustable filler panels to fill openings.

F. Install doors complete with door hardware.

G. Weld or bolt sheet metal bases to wire mesh partitions.

H. Bolt accessories to wire mesh partition framing.

3.3 REPAIR

A. Repair Painting:
   1. Wire brush and clean rust spots, welds, and abraded areas immediately after installation, and apply repair paint with same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
      a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.4 ADJUSTING

A. Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly. Verify that latches and locks engage accurately and securely without forcing or binding.

3.5 PROTECTION

A. Remove and replace defective work, including doors and framing that are warped, bowed, or otherwise unacceptable.

END OF SECTION 10 22 13

SECTION 10 22 39 - FOLDING GLASS PARTITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes furnishing and installing a sliding-folding thermally broken, acoustically rated, aluminum-framed glass panel system that includes:

1. Aluminum framed panels.
2. Threshold.
3. Sliding-folding and locking hardware.
4. Sound gasketing.
5. Multipurpose frame insert.
6. Panel Catch.
7. Glass and glazing.
8. Accessories as required for a complete working installation.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate Folding Glass Partition system and framing R.O.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer’s printed product literature for each Folding Glass Partition system to be incorporated into the Work. Show performance test results and details of construction relative to materials, dimensions of individual components, profiles, and colors.

B. Product Drawings: Indicate Folding Glass Partition system component sizes, dimensions and framing R.O., configuration, swing panels, direction of swing, stacking layout, typical head jamb, side jambs and sill details, type of glazing material, handle height, and field measurements.

C. Manufacturers' Instructions: Submit Owner’s Manual from manufacturer which includes installation instructions, operation, and maintenance data: Identify with project name, location and completion date, and type and size of unit installed.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer capable of providing complete, precision built, engineered, pre-fitted units with thirty five (35) years’ experience in the sale of folding-sliding door systems for large openings in the North American market.

B. Installer Qualifications: Installer experienced in the installation of manufacturer’s products or other similar products for large openings. Installer to provide reference list of at least three (3) projects of similar scale and complexity successfully completed in the last three (3) years.

1. Installer to be trained and certified by manufacturer.

C. Single Source Responsibility: Furnish Folding Glass Partition system materials from one manufacturer for entire Project.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's instructions and recommendations, and as follows:

1. Deliver materials to job site in sealed, unopened cartons or crates.
   a. Upon receipt, inspect the shipment to ensure it is complete, in good condition and meets project requirements.
2. Store material under cover in a clean and dry location, protecting units against weather and defacement or damage from construction activities, especially to the edges of panels.

1.06 FIELD CONDITIONS

A. Field Measurements: Contractor to field verify dimensions of rough openings (R.O.) and threshold depressions to receive sill. Mark field measurements on product drawings submittal.

1.07 WARRANTY

A. Manufacturer Warranty: Provide Folding Glass Partition system manufacturer's standard limited warranty as per manufacturer's published warranty document in force at time of purchase, subject to change, against defects in materials and workmanship.

1. Warranty Period beginning with the Date of Substantial Completion:
   a. Rollers and Glass Seal Failure: Ten (10) years.
   b. All Other Components: Ten (10) years.
      1). Exception: Five (5) years if NOT installed by manufacturer's specific system approved or certified trained installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product by Manufacturer: Generation 4 Comprehensive Product Line by NanaWall NW Acoustical 645 (www.nanawall.com).

2.02 PERFORMANCE / DESIGN CRITERIA

A. Performance Criteria:

1. Acoustic Performance STC (Rw).
   a. System STC (Rw) 35 (35) with 1/4-inch STC 35 laminated glass.
2. Swing Panel - Operation / Cycling Performance (AAMA 920): 500,000 cycles.
3. .Operating Force (ASTM E2068):
   a. Folding Panel:
      1). Initiate Motion - Open 4 lbf & Close 3 lbf.
      2). Maintain Motion - Open 1 lbf & Close 1 lbf.
4. Forced Entry (AAMA 1304): Pass.

B. Design Criteria:
   1. Sizes and Configurations: As indicated by the Drawings for selected number and size of panels, location of swing and folding panels, and number of panels stacking to the left and to the right.
   2. Unit Operation: Adjustable folding hardware with top and bottom tracks.
   3. Mounting Type: Floor track supported with upper guide track.
   4. Panel Configuration:
      a. Straight.
   5. Stack Storage Configuration:
      a. Inswing type and stack storage inside jamb.
   6. Sill Type:
      a. Flush sill - ADA compliant with high heel protector insert.
   7. Panel Type: Hinged.
      a. Without Entry/Egress panel hinged to side jamb.
   8. Panel Pairing Configuration: See drawings.
      a. Bi-folding panels hinged to side jamb.

2.03 MATERIALS

A. Thermally Broken Aluminum Framed Folding Glass Description: Nominal frame stile width of 3-7/8 inch between folding panels, floor track supported system. Manufacturer's standard thermally broken frame and panel profiles, with head track, side jambs, sill and panels with dimensions as shown on Drawings.
   1. Panels and Frame:
      a. Panels:
         1). Single lite.
         2). Multiple lites with horizontal mullion(s) at height(s) indicated from the bottom of the panel.
         3). Panel Size (W x H): As indicated.
         4). Rail Depth: 2-5/8 inch.
         5). Top Rail and Stile Width: 2-7/8 inch.
         6). Bottom Rail Width:
            i. 2-5/8 inch.
      b. Frame:
         1). Thermally broken top track and side jambs with multipurpose frame insert to hide anchoring frame connections and conceal cable routing to security system by others. For long-term tight, consistent sealing, provide a lateral patented (Patent Number: US10683688B2) adjustment feature at the side jambs capable of adjustment of +/ - 3/16-inch. Frame finish to match panel finish.

2). Frame Depth: 2-15/16 inch.

3). Head Track Width:

i. 2-13/16 inch standard.

4). Side Jamb Width: 2 inches.

5). Sill Finish:

i. Black anodized finish.

2. Aluminum Extrusion: AlMgSi0.5 alloy, 6063-T5.
   a. Thickness: 0.078 inch nominal.
   b. Acoustic Break: 1-1/4 inch wide specially designed and patented (Patent Number: US10550625B2) glass fiber reinforced (GFR) polyamide “Bionic Turtle®” for panels.
3. Aluminum Finish:
   a. Inside and Outside;
      1). Same (one-color).
   b. Anodized (AAMA 611):
      1). Dark Bronze.

B. Glass and Glazing:
1. Safety Glazing: In compliance with ASTM C1036, ASTM C1048, ANSI Z97.1 and CPSC 16CFR 1201.
2. Manufacturer’s laminated glass lites in single glazing units, dry glazed with glass stops on the inside.
   a. Single Glass:
      1). 1/4-inch STC 35 laminated glass to achieve unit STC of 35.
   b. Glass Lite Type:
      1). Low iron (Light Transmission LT 91%).

C. Locking Hardware and Handles:
1. Pairs of Folding Panels: Provide manufacturer’s flat handles and concealed two-point locking hardware operated by 180° turn of handle between each pair. Face applied flush bolt locking NOT acceptable.
   a. Flat Handle - Finish:
      1). Black titanium stainless steel.
2. Handle Height: 41-3/8 inch centered from bottom of panel or as otherwise indicated.
3. Locking rods with standard end caps at the top and bottom. Rods to have a stroke of 15/16 inch.
4. Panel Catch: panel catch to hold swing panel to adjacent folding panel to prevent incorrect operation when moving the panel.

D. Sliding-Folding Hardware: Provide manufacturer's standard combination sliding and folding hardware with top and bottom tracks and threshold. All bottom rollers to be with sealed, self-lubricating, double ball bearing multi-rollers. Surface mounted hinges and bottom rollers NOT acceptable.

1. Bottom Rollers Carrying Capacity: 250 lb. (120 kg). Bottom rollers provided with two vertical stainless-steel wheels with double row of ball bearings and two horizontal polyamide wheels.
2. Vertical wheels with Gothic arch feature to ride on top of stainless-steel guide track covers over the full length of the sill track. Wheels riding on aluminum surfaces NOT acceptable.
3. Upper guide rollers with two horizontal polyamide guiding wheels. For configurations with unhinged FourFold and SixFold panel sets that can slide left or right, additional concealed, additional vertical tilt protection hardware.
4. Hinges and Rollers: Black anodized aluminum with stainless steel security hinge pins and set-screws. Concealed panel alignment with a tight seal through the patented (Patent Number: US10711510B2) TwinX mechanism reinforced between panels. Double ball bearing stainless wheels rollers match hinge finish.
5. Spring-Loaded Pull Handle: For outswing units with larger panel sizes, a spring-loaded pull handle is supplied for ease of closing the system. The pull handle is located above the flat handle. When not in use, the handle lays flat against the adjacent panel and is supplied with bumpers to avoid metal-to-metal contact. Handles are stainless steel with the attachment to coordinate with the hinge hardware of the system.
    a. Pull Handle – Finish:
        1). Black titanium stainless steel.

E. Sound Gasketing: Manufacturer's double layer EPDM between panels and EPDM gasket, Q-Ion gasket, or brush seal between panel and frame, or brush seals with a two-layer fiberglass reinforced polyamide fin attached at both inner and outer edge of bottom of door panels with a recessed sill or on frame for sealing between panels and between panel and frame.

F. Fasteners: Installation plates for connecting frame components made of stainless steel with sealing cushion to avoid thermal connectivity.

2.04 FABRICATION

A. Folding Glass Wall: Extruded aluminum frame and panel profiles, corner connectors and hinges, sliding and folding hardware, locking hardware and handles, glass and glazing and sound gasketing.

1. Each unit factory pre-assembled and shipped with complete system components and installation instructions.
2. Exposed work to be carefully matched to produce continuity of line and design with all joints.
3. No raw edges visible at joints.

2.05 ACCESSORIES

A. Provide sidelights, transoms, corner posts, or single or double doors as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examination and Acceptance of Conditions as follows:

1. Carefully examine rough openings with Installer present, for compliance with requirements affecting Work performance.
    a. Examine surfaces of openings and verify dimensions; verify rough openings are level, plumb, and square with no unevenness, bowing, or bumps on the floor; and other conditions as required by the manufacturer for readiness to receive Work.
    b. Verify structural integrity of the header for deflection with live and dead loads limited to 1/4 inch. Provide structural support for lateral loads, and both wind load and eccentric load when the panels are stacked open.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install Folding Glass Partition system in accordance with the Drawings, approved submittals, manufacturer's recommendations, and installation instructions, and as follows:

1. Properly seal around opening perimeter to reduce sound infiltration from surroundings.
2. Securely attach anchorage devices to rigidly fit frame in place, level, straight, plumb, and square. Install frame in proper elevation, plane, and location, and in proper alignment with other work.
3. Install panels, handles, lockset, gasketing and other accessories in accordance with manufacturer's recommendations and instructions.

3.03 FIELD QUALITY CONTROL

A. Field Tests and Inspections:

1. Verify the Folding Glass Partition system operates and functions properly. Adjust hardware for proper operation.

B. Non-Conforming Work: Repair or replace non-conforming work as directed by the Architect; see General and Supplementary Conditions, and Division 01, General Requirements.

3.04 CLEANING AND PROTECTION

A. Keep units closed and protect Folding Glass Partition installation against damage from construction activities.

B. Remove protective coatings and use manufacturer recommended methods to clean exposed surfaces.

END OF SECTION

SECTION 10 26 00 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall guards.
   2. Corner guards.
   3. Abuse-resistant wall coverings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For each type of wall and door protection showing locations and extent.
   1. Include plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.

D. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:
   1. Wall Guards: 12 inches long. Include examples of joinery, corners, and field splices.
   2. Corner Guards: 12 inches long. Include example top caps.
   3. Abuse-Resistant Wall Covering: 6 by 6 inches square.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.
   1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
   1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
   2. Keep plastic materials out of direct sunlight.

3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
    a. Store corner-guard covers in a vertical position.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
    1. Failures include, but are not limited to, the following:
        a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
        b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
    2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. Construction Specialties, Inc.
    2. Inpro.
    3. Pawling Corp., Architectural Products Div.

B. Source Limitations: Obtain wall- and door-protection products from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    1. Flame-Spread Index: 25 or less.
    2. Smoke-Developed Index: 450 or less.

2.3 WALL GUARDS

A. Crash Rail (CR): Stainless steel assembly with H-bracket; designed to withstand impacts.
    1. Product/Manufacturer: Basis of design.
        a. As indicated on Drawings.
    2. Materials:
        a. Stainless Steel: Wall Guards shall be manufactured from Type 304, 16-gauge Stainless Steel.
        b. Neoprene: Gasket shall be fabricated from 70A durometer neoprene.

3. Components:
   a. Wall guard rail, returns, outside corners and inside corners shall be stainless steel and a finish to match crash rails, with no fasteners visible on rail.
   b. Aluminum H bracket shall be fabricated from extruded aluminum.
   c. Fasteners: All mounting system accessories appropriate for substrates shall be provided.
4. Finishes:
   a. Stainless Steel: Stainless steel wall guard shall have a #4 satin finish.
   b. Aluminum: Aluminum bracket shall have a clear anodized finish.
   c. Neoprene: Neoprene gasket shall be black.
5. Mounting: Surface mounted directly to wall.

2.4 CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards (CG): Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Material: Stainless-steel sheet, Type 304.
      a. Thickness: Minimum 0.0625 inch.
      b. Finish: Directional satin, No. 4.
   3. Wing Size: Nominal 2 by 2 inches.
   4. Corner Radius: 1/8 inch.
   5. Mounting: Adhesive.

2.5 ABUSE-RESISTANT WALL COVERINGS

A. Abuse-Resistant Sheet Wall Covering (WP): Fabricated from semirigid, plastic sheet wall-covering material.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Sheet Thickness: 0.040 inch.
   3. Color and Texture: As indicated by manufacturer's designations.
   4. Height: As indicated.
   5. Trim and Joint Moldings: Sealed joints, no top cap, corner trim at outside corners. Extruded rigid plastic that matches wall-covering color.
   6. Mounting: Adhesive.

2.6 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.

B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

C. Adhesive: As recommended by protection product manufacturer.

2.7 FABRICATION

A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.8 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
   1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing wall and door protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
   1. Provide anchoring devices and suitable locations to withstand imposed loads.

D. Abuse-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.4 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 10 26 00

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SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Public-use washroom accessories.
   2. Hand dryers.
   3. Childcare accessories.
   4. Custodial accessories.

1.2 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
   2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Include electrical characteristics.

B. Samples: For each exposed product and for each finish specified, full size.
   1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
   1. Identify locations using room designations indicated.
   2. Identify accessories using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, visible silver spoilage defects.
   2. Warranty Period: 15 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Hand Dryers: Manufacturer agrees to repair or replace hand dryers that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Seven years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED OWNER INSTALLED MATERIALS (OFOI)

A. As indicated on Drawings.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Structural Performance: Design accessories and fasteners to comply with the following requirements:
   1. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.

2.3 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. ASI American Specialties.
   2. Bobrick Washroom Equipment, Inc.
   3. Bradley Corp.
   4. Excel Dryer Inc.

2.4 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

B. Grab Bar:
   1. Mounting: Flanges with concealed fasteners.
   2. Material: Stainless steel, 0.05 inch thick.

a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.
3. Outside Diameter: 1-1/2 inches.
4. Configuration and Length: As indicated on Drawings.

C. Sanitary-Napkin Disposal Unit:
1. Mounting: Surface mounted.
2. Door or Cover: Self-closing, disposal-opening cover and hinged face panel with tumbler lockset.
3. Receptacle: Removable.
4. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

D. Mirror Unit:
1. Frame: Stainless steel channel.
a. Corners: Welded and ground smooth.
2. Size: As indicated on Drawings.
3. Hangers: Manufacturer's standard rigid, tamper and theft resistant.

2.5 HAND DRYERS

A. Source Limitations: Obtain hand dryers from single source from single manufacturer.

A. Product/Manufacturer: Basis of design.
1. Xlerator Model XL-SB-ECO Brushed Stainless Steel; Excel Dryer Inc.

B. High Efficiency Non-Heated Air Hand Dryer: High speed, rapid drying, energy, efficient electric hand dryer with adjustable automatic sensor, adjustable speed, sound controls; semi-recessed; entire dryer internally grounded. Hand Dryers have been independently tested to UL Environment Global Hand Dryer Product Category Rules (PCR) Guidelines. Made in the USA Certified.
1. Cover: Stainless steel.
2. Finish: Brushed Number 4 finish.
3. HEPA Filtration System: Removes 99.999 percent of viral surrogate organisms of E.coil bacteriophage MS2 (ATCC 15597-B1) as tested using parts of ASTM F 2100 and ASTM F 2101.
4. Noise Reduction Nozzle: Reduces air deflection noise level by 9 dB and increases the dry time by 2-3 seconds.
5. Recessed: ADA compliant recess kit Model # 40502 is fabricated of 22 GA 18-8 type 304 stainless steel with #4 satin finish with 16 GA 18-8 type 304 stainless steel dryer mounting plate. All welded construction. 16-3/8 inches wide by 26 inches high by 3-3/8 inches deep.
6. Controls: Automatic, activated by infrared optical sensor located next to the air outlet. Dryer operates if hands are under the air outlet and has a 35- second lockout feature if hands are not removed. Control includes adjustable sound and speed control mechanism, and a filter sensor which is activated should the filter become clogged. Sensor equipped with externally visible Red LED light that flashes error codes to assist in troubleshooting. Control assembly sealed for protection against moisture, lint, dust, and vandalism.

7. All metal parts coated according to Underwriters Laboratories, Inc. requirements.
8. Air Intake: Inlet openings on bottom of cover.
9. Air Outlet: Provides air velocity of 20,000 LFM at the air outlet and 17,000 LFM at the hands, 4 inches below air outlet.
10. Nominal Size: 11-3/4 inches wide by 12-11/16 inches high by 6-11/16 inches deep.
11. Power Source: As indicated on Drawings.
12. Combination Motor and Blower: Series commutated, through-flow discharge, vacuum type; 5/8 HP, 20,000 RPM. Airflow rate: 19,000 linear feet per minute at air outlet, 16,000 linear feet per minute at average hand position of 4 inches below air outlet. Includes a washable metal mesh filter for more reliable performance.
13. Air Temperature: Ambient room temperature.
14. All metal parts coated according to Underwriters Laboratories, Inc. requirements.
15. Mount at the following heights above floor surface: Mount dryers at heights indicated on Drawings.

2.6 CHILDCARE ACCESSORIES

A. Source Limitations: Obtain childcare accessories from single source from single manufacturer.

B. Diaper-Changing Station:
1. Description: Vertical unit that opens by folding down from stored position and with child-protection strap.
   a. Engineered to support minimum of 250-lb static load when opened.
2. Mounting: Semirecessed, with unit projecting not more than 1 inch from wall when closed.
3. Operation: By pneumatic shock-absorbing mechanism.
4. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin), exterior shell with rounded plastic corners; HDPE interior in manufacturer's standard color.
5. Liner Dispenser: Provide built-in dispenser for disposable sanitary liners.

2.7 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Custodial Mop and Broom Holder:
1. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
2. Length: 36 inches.
3. Hooks: Four.
4. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
   a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.
   b. Rod: Approximately 1/4-inch- diameter stainless steel.

2.8 MATERIALS

A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B19, flat products; ASTM B16/B16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.

C. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch- minimum nominal thickness.

D. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

F. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.9 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
   1. Remove temporary labels and protective coatings.

B. Grab Bars: Install to comply with specified structural-performance requirements.

C. Shower Seats: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 10 28 00

SECTION 10 44 13 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire-protection cabinets for the following:
      a. Portable fire extinguisher.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

B. Shop Drawings: For fire-protection cabinets.
   1. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Initial Selection: For each type of exposed finish required.

D. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.3 FIRE-PROTECTION CABINET (FEC)

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Babcock-Davis.
   2. J. L. Industries, Inc.; Activar Construction Products Group, Inc. (Activar Construction Products Group, Inc.).
   3. Larsen's Manufacturing Company.
   4. Nystrom Building Products.

B. Fire-Protection Cabinet Type: Suitable for fire extinguisher.

C. Cabinet Construction: Nonrated.
   1. Provide fire rated cabinet where indicated to be installed in fire rated wall construction.
   2. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch- thick cold-rolled steel sheet lined with minimum 5/8-inch- thick fire-barrier material. Provide factory-drilled mounting holes.

D. Cabinet Material: Cold-rolled steel sheet.
   1. Shelf: Same metal and finish as cabinet.

E. Recessed Cabinet:
   1. Trimless with Concealed Flange: Surface of surrounding wall finishes flush with exterior finished surface of cabinet frame and door, without overlapping trim attached to cabinet. Provide recessed flange, of same material as box, attached to box, to act as drywall bead.

F. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
   1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

G. Cabinet Trim Material: Steel sheet.

H. Door Material: Steel sheet.

I. Door Style: Solid opaque panel with frame.

J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
   1. Provide recessed door pull and friction latch.

2. Provide continuous hinge, of same material and finish as trim,, permitting door to open 180 degrees.

K. Accessories:
1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Owner.
a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
1) Application Process: Pressure-sensitive vinyl letters.
2) Lettering Color: Red.
3) Orientation: Horizontal.

L. Materials:
1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.
a. Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.
b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
c. Color: As selected by Architect from manufacturer's full range.

2.4 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.
4. Prepare doors and frames to receive locks.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for recessed and semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION OF FIRE-PROTECTION CABINETS

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
   1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.
   2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
   3. Fire-Rated Cabinets:
      a. Seal through penetrations with firestopping sealant as specified in Section 07 84 13 "Penetration Firestopping."

C. Identification:
   1. Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 44 13

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SECTION 10 44 16 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.5 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
      b. Faulty operation of valves or release levers.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
   1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet mounting bracket indicated.
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. J. L. Industries, Inc.; Activar Construction Products Group, Inc. (Activar Construction Products Group, Inc.).
      b. Kidde Residential & Commercial Division.
      c. Larsens Manufacturing Company.
      d. Moon American.
   2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
   3. Valves: Manufacturer's standard.
   4. Handles and Levers: Manufacturer's standard.
   5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Fire Extinguisher for Kitchen and Food Service Area:
   1. Wet-Chemical Type: UL-rated 2-A:1-B:C:K, 2.5-gal. nominal capacity, with potassium acetate -based chemical in stainless steel container; with pressure-indicating gage.

C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
   1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
      a. Orientation: Horizontal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.
   1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 10 44 16

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SECTION 10 51 29 - PHENOLIC LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Phenolic lockers.
   2. Phenolic locker benches.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.
      a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:
   1. Plans, elevations, sections, and attachment details.
   2. Details full size.
   3. Locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
   4. Locations and sizes of cutouts and holes for items installed in lockers.
   5. Locker fillers, trim, base, sloping tops, and accessories.
   6. Locker identification system and numbering sequence.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of phenolic locker. Include full range of available options for hardware and accessories involving material, finish, and/or color selection.

D. Samples for Verification: Actual sample of finished products for each type of phenolic locker, hardware, and accessory.
   1. Size: Manufacturers' standard size.

1.3 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For phenolic panel, by a qualified testing agency.

B. Qualification Statements: For Installer.

C. Sample Warranties: For phenolic lockers.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For phenolic lockers including adjusting, repairing, and replacing locker doors and latching mechanisms.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Materials: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish locker hardware of type and finish installed, but no fewer than the following:
      a. Twelve hinges.
      b. Six pulls.
      c. Six blank number identification plates.
      d. Twelve hooks.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for their installation.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with lockers by field measurements, and coordinate before fabrication.

1.9 COORDINATION

A. Coordinate sizes and locations of concealed wood support bases.
   1. Requirements are specified in Section 06 10 00 "Rough Carpentry."

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that lockers can be supported and installed as indicated.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of lockers that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures.
      b. Faulty operation of locks or hardware.
      c. Deterioration of finishes and materials beyond normal use.
   2. Warranty Period: Twenty years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain phenolic lockers, phenolic locker benches, and hardware and accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 75 or less.
   2. Smoke-Developed Index: 450 or less.

B. Accessibility Regulations: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for lockers and locker benches designated as accessible.

2.3 PHENOLIC LOCKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. ASI Storage Solutions (ASI American Specialties, Inc.; ASI Group).
   2. Bradley Corp.
   3. Summit Lockers.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

C. Construction Style: Manufacturer's standard factory-assembled flush overlay units.

D. Locker Body: Solid phenolic-core material with melamine facing on both sides fused to substrate during manufacture (not separately laminated), and with beveled and polished edges.
   1. Thickness:
      a. Side Panels: 5/16 inch 3/8 inch.
      b. Back Panel: 5/16 inch.
      c. Top Panel: 3/8 inch.
      d. Bottom Panel: 3/8 inch.

E. Doors: Solid phenolic-core material with melamine facing on both sides fused to substrate during manufacture (not separately laminated), and with beveled and polished edges.
   1. Thickness: 1/2 inch.

F. End Panels: Match style, material, construction, thickness, and finish of doors.

G. Fixed Shelves: Match style, material, construction, and finish of locker body.
   1. Thickness: 3/8 inch.

H. Corners and Filler Panels: Match style, material, construction, thickness, and finish of doors.

I. Continuous Finish Base: Match style, material, construction, thickness, and finish of doors; fabricated in lengths as long as practical to enclose base and base ends of lockers.

J. Phenolic Locker Finish:
   1. Black-Core Phenolic:
      a. Facing Sheet Color:
         1) Locker Body: As indicated by manufacturer's designations.
         2) Doors: As indicated by manufacturer's designations.
      b. Exposed Edges: Manufacturer's standard black edge.

2.4 HARDWARE

A. Locking Device:
   1. Padlock Hasp: Recessed, steel, through bolted.
      a. Finish: Manufacturer's standard.

B. Hinges:
   1. Butt Hinges: Concealed , six-knuckle stainless steel hinges; back mounted.
      a. Provide two hinges for doors 36 inches high and less.
      b. Provide three hinges for doors more than 36 inches high.

C. Handle:
   1. Recessed Handle: Recessed cup with integral door pull.
      a. Material and Finish: Manufacturer's standard.
   2. Accessible Handle: Metal, fixed, graspable lever handle and rose trim; surface mounted.
      a. Material and Finish: Manufacturer's standard.

D. Hooks: Ball-pointed hooks. Attach hooks with at least two fasteners.
   1. Hook Configuration:
      a. Manufacturer's standard.
      b. Provide two single-prong wall hooks for each compartment .
   2. Material and Finish: Manufacturer's standard.

2.5 ACCESSORIES

A. Number Identification:
   1. Manufacturer's standard.
   2. Number Plates: 1-1/2-by-2-1/4-inch- rectangular, etched, embossed, or stamped, aluminum or stainless steel plates with black numbers and letters at least 1/2 inch high. Identify lockers in sequence indicated on Drawings.

2.6 PHENOLIC LOCKER BENCHES

A. Bench Top: 1-inch- thick, solid phenolic-core material with melamine facing on both sides fused to substrate during manufacture (not separately laminated), and with radiused corners and eased and polished edges.
   1. Width: 12 inches.
      a. Provide 24-inch maximum width where accessible benches are indicated.
   2. Height: 18 inches measured from top of bench to floor.
      a. Provide 17-inch minimum and 19-inch maximum height measured from top of bench to floor where accessible benches are indicated.
   3. Length: As indicated.
   4. Finish:
      a. Black-Core Phenolic:
         1) Facing Sheet Color: As indicated by manufacturer's designations.
         2) Exposed Edges: Manufacturer's standard black edge.

B. Bench Supports:
   1. Trapezoidal Pedestal Supports: Manufacturer's standard 1/8-inch-thick by 2-inch-wide channel or 1/4-inch-thick by 2-inch-wide bar stock, shaped into trapezoidal form; with nonskid pads at bottom. Provide predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors.
      a. Material: Powder coated aluminum.
      b. Color: As selected by Architect from manufacturer's full range.
   2. Tube Pedestal Supports: Manufacturer's standard 1-1/2-inch- diameter, tubular pedestal supports with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, minimum of two pedestals for each bench.
      a. Material: Powder coated aluminum.
      b. Color: As selected by Architect from manufacturer's full range.

2.7 MATERIALS

A. Anchors: Material, type, size, and finish as required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.8 FABRICATION

A. Fabricate each locker with shelves, an individual door and frame, an individual top, a bottom, and a back, and with common intermediate uprights separating compartments.
   1. Fabricate lockers to dimensions, profiles, and details indicated.

B. Fabricate lockers square, rigid, without warp, and with finished faces flat and free of dents, scratches, and chips. Accurately factory machine components for attachments. Make joints tight and true.

C. Accessible Lockers: Fabricate as follows:
   1. Locate bottom shelf no lower than 15 inches above the floor.
   2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches above the floor.

D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Use only manufacturer's nuts, bolts, screws, and other devices for assembly.

E. Shop cut openings, to maximum extent possible, to receive hardware, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and floors or support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that furring is attached to concrete and masonry walls that are to receive lockers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install lockers level, plumb, and true; shim as required, using concealed shims.
   1. Connect single rows of lockers together side-to-side at each locker. Connect back-to-back lockers together side-to-side at each locker and back-to-back at each locker. Use manufacturer's standard connecting bolts, through predrilled holes, with no exposed fasteners on face frames. Fit lockers accurately together to form flush, tight, hairline joints.
   2. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c., using manufacturer's standard concealed fasteners for material indicated.
      a. Anchor single rows of lockers to walls near top and bottom of lockers.
      b. Anchor back-to-back lockers to wood support base.

B. Install lockers without distortion so doors fit openings properly and are accurately aligned. Adjust hardware to center doors in openings, providing unencumbered operation. Complete installation of hardware and accessory items as indicated.

C. Installation Tolerance: No more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line. Shim as required with concealed shims.

D. Scribe and cut corner and filler panels to fit adjoining work using fasteners concealed where practical. Repair damaged finish at cuts.

E. Attach sloping-top units to lockers, with end panels covering exposed ends.

F. Install number identification plates after lockers are in place.
   1. Attach number identification plate on each locker door, near top, centered, with at least two screws with finish matching the plate.

G. Fixed Locker Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

H. Movable Locker Benches: Place benches in locations indicated on Drawings.

3.3 ADJUSTING

A. Clean, lubricate, and adjust hardware. Adjust doors to operate easily without binding.

3.4 PROTECTION

A. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

B. Touch up marred finishes, or replace lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 10 51 23

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SECTION 10 51 43 - WIRE MESH STORAGE LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Woven wire mesh storage lockers.

1.2 ACTION SUBMITTALS

A. Product Data:
   1. For each type of product.
      a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:
   1. Plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of wire mesh storage locker with factory-applied color finishes.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Qualification Statements: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
   1. AWS D1.1/D1.1M.
   2. AWS D1.3/D1.3M.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire mesh storage lockers with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Use vented plastic.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh storage lockers by field measurements and coordinate before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Regulations: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for wire mesh storage lockers designated as accessible.

2.2 WOVEN WIRE MESH STORAGE LOCKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Acorn Wire & Iron Works.
   2. Indiana Wire Products, Inc.
   3. King Wire Partitions, Inc.

B. Woven Wire Mesh: 10-gauge, intermediate-crimp steel wire woven into 1-1/2-inch diamond mesh.

C. Locker Configuration: Single tier.

D. Unit Sizes: As indicated on Drawings.

E. Wall Panels: Woven wire mesh welded to manufacturer's standard 1-1/4-by-1-1/4-by-1/8-inch steel angle framing.
   1. Horizontal Panel Stiffeners: Manufacturer's standard.

F. Back Panels: Fabricated from same mesh and framing as wall panels. Required for back-to-back units only.

G. Ceiling Panels: Fabricated from same mesh and framing as wall panels.

H. Doors: Fabricated from same mesh and framing as wall panels.
   1. Locking Device: Padlock hasp.
   2. Stiffener for Single-Tier Doors: 1/2-inch- diameter steel rods or 3/4-by-1/4-inch steel flat bars, diagonal from center of door to corners.
   3. Hinges: Full-surface type, 2-1/2-by-2-1/2-inch steel, 1-1/2 pairs per single-tier door; welded to door and jamb framing.

I. Finish for Uncoated Ferrous Steel: HAA polyester powder-coated finish unless otherwise indicated.
   1. Color: As selected by Architect from manufacturer's full range.

2.3 MATERIALS

A. Steel Wire: ASTM A510/A510M.

B. Steel Plates, Channels, Angles, and Bars: ASTM A36/A36M.

C. Steel Sheet: Cold-rolled steel sheet, ASTM A1008/A1008M, Commercial Steel (CS), Type B.

D. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B, with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.

E. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.

F. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
   1. Material: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 FABRICATION

A. General: Fabricate wire mesh storage lockers from components of sizes not less than those indicated. Use larger size components as recommended by wire mesh manufacturer. Furnish bolts, hardware, and accessories required for complete installation with manufacturer's standard finishes.
   1. Fabricate wire mesh storage lockers to be readily disassembled.
   2. Welding: Weld corner joints of framing and grind smooth, leaving no evidence of joint.

B. Wire Mesh Storage Lockers: Fabricate initial storage locker with front and two sides. Fabricate additional storage lockers as add-on units designed to share one side with initial storage locker.
   1. Fabricate wall panel and door framing with slotted holes for connecting adjacent panels.
   2. Prehang doors in factory.

2.5 STEEL AND IRON FINISHES

A. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

B. Powder-Coat Finish: Complying with AAMA 2603.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine floors for suitable conditions where wire mesh storage lockers will be installed.

C. Examine walls to which wire mesh storage lockers will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Anchor wire mesh storage lockers to floor with 3/8-inch- diameter expansion anchors at 12 inches o.c. through bottom panel framing. Shim panel framing as required to achieve level and plumb installation.

B. Anchor wire mesh storage lockers to walls at 12 inches o.c. through back corner panel framing and as follows:
   1. For concrete and solid masonry anchorage, use expansion anchors.
   2. For hollow masonry anchorage, use toggle bolts.
   3. For steel-framed gypsum board assemblies, use lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
   4. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

C. Attach adjacent wire mesh storage lockers to each other through side panel framing.

D. Install doors complete with door hardware.

3.3 ADJUSTING AND CLEANING

A. Adjust doors to operate smoothly and easily without binding or warping. Adjust hardware to function smoothly. Confirm that hasps engage accurately and securely without forcing or binding.

B. Remove and replace defective work, including doors and framing that are warped, bowed, or otherwise unacceptable.

C. Touchup Painting:
   1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 10 51 43

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SECTION 11 30 13 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cooking appliances.
   2. Refrigeration appliances.
   3. Cleaning appliances.

1.2 ACTION SUBMITTALS

A. Product Data Submittals: For each product.
   1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.4 WARRANTY

A. Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. GE Appliances.
   2. Maytag Corporation.
   3. Summit Appliance Division, Felix Storch, Inc. (Summit)
   4. Whirlpool Corporation.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

2.3 COOKING APPLIANCES

A. Microwave Oven:
   1. Product/Manufacturer: Basis of design.
      a. Model SCM853; Summit.
   2. Type: Conventional.
   3. Dimensions:
      a. Width: 18.88 inches.
      b. Depth: 14.25 inches.
      c. Height: 11 inches.
   4. Capacity: 0.9 cu. ft..
   5. Oven Door: Door with observation window and pushbutton latch release.
   6. Microwave Power Rating: 900 W.
   7. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
   8. Controls: Digital panel controls and timer display.
   9. Other Features: Turntable.
   10. Material: Stainless steel.

2.4 REFRIGERATION APPLIANCES

A. Refrigerator/Freezer: Two-door refrigerator/freezer with freezer on bottom and complying with AHAM HRF-1.
   1. Product/Manufacturer: Basis of design.
      a. Model FFBF279SSXLHD; Summit.
   2. Type: Freestanding.
   3. Dimensions:
      a. Width: 27.63 inches.
      b. Depth: 26.75 inches.
      c. Height: 67.63 inches.
   4. Storage Capacity:
      a. Refrigeration Compartment Volume: 14.6 cu. ft..
      b. Freezer Volume: 3.96 cu. ft..
      c. Shelf Area: Three adjustable glass shelves. .
   5. Refrigerator Features:
      a. Interior light in refrigeration compartment.
      b. Compartment Storage: vegetable crisper and meat compartment.
      c. Door Storage: Modular compartments.
   6. Freezer Features: One freezer compartment(s) with swing door(s).
      a. Automatic defrost.
   7. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
   8. Front Panel(s): Stainless steel.

B. Undercounter Refrigerator:
   1. Product/Manufacturer: Basis of design.
      a. Model AL54; Summit.
   2. Type: Undercounter.
   3. Dimensions:
      a. Width: 23.63 inches.
      b. Depth: 22.63 inches.
      c. Height: 32 inches.
   4. Storage Capacity:
      a. Refrigeration Compartment Volume: 4.8 cu. ft..
   5. Front Panel(s): Stainless steel.

2.5 CLEANING APPLIANCES

A. Clothes Washer Insert drawing designation: Complying with AHAM HLW-1.
   1. Product/Manufacturer: Basis of design.
      a. Model LW2427; Summit.
   2. Type: Freestanding, front-loading unit.
   3. Dimensions:
      a. Width: 23.75 inches.
      b. Depth: 24.75 inches.
      c. Height: 33.5 inches.
   4. Drum: Perforated stainless steel.
      a. Capacity: 2.7 cu. ft..
   5. Controls: Digital and Dial controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.
      a. Wash Cycles: 15 wash cycles, including regular, delicate, and permanent press.
      b. Wash Temperatures: Three settings.
   6. Electrical Power: 120 V, 60 Hz, 1 phase, 15 A.
   7. Motor: Manufacturer's standard with built-in overload protector.
   8. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
   9. Appliance Finish: Enamel.
      a. Color: White.

B. Clothes Dryer: Complying with AHAM HLD-1.
   1. Product/Manufacturer: Basis of design.
      a. Model LD2444; Summit.
   2. Type: Freestanding, frontloading, electric, ventless unit.
   3. Dimensions:
      a. Width: 23.75 inches.
      b. Depth: 24.75 inches.
      c. Height: 33.5 inches.
   4. Drum: Perforated stainless steel.
      a. Capacity: 4.4 cu. ft..
   5. Controls: Digital and Dial controls for drying cycle, temperatures, and fabric selectors.

6. Electric-Dryer Power: 220 V, 60 Hz, 1 phase, 30 A.
7. Appliance Finish: Enamel.
    a. Color: White.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install appliances according to manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION 11 30 13

SECTION 11 40 00 - FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes food service equipment indicated on Drawings and schedules.

B. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment items.

C. Related Sections: The following Documents and Sections contain requirements that relate to this section:
   1. Refer to Division 21 Sections for connections to fire alarm systems, electrical wiring, disconnects, and other electrical materials required to complete the installation of the food service equipment.
   2. Refer to Division 23 Sections for supply and exhaust fans; exhaust ductwork; service roughing-ins; drain traps; atmospheric vents; valves, pipes, and fittings; fire extinguishing systems; and other materials required to complete the food service equipment installation.

1.2 DEFINITIONS

A. Terminology Standard: Refer to NSF 2, "Food Equipment" or other applicable NSF standards for definitions of food service equipment and installation terms not otherwise defined in this Section or in other referenced standards.

1.3 SUBMITTALS

A. Product Data: For each type of food service equipment indicated. Include manufacturer's model number and accessories and requirements for access and maintenance clearances, water and drainage, power or fuel, and service-connections including roughing-in dimensions.

B. Drawings: In accordance with the project schedule furnish the Consultant and Owner's representative with one full size set of electronic documents in the universally compatible PDF (Portable Document Format) file format. Reproduced copies of bid documents shall not be accepted if used as part of this submittal. Hard copies may also be required by the Owner.
   1. Prepare plans at 1/4"=1'-0" scale showing all items of foodservice equipment. Each item shall have a numbered tag keyed to the item specifications detailed herein.
   2. Prepare separate dimensioned electrical and mechanical rough-in drawings at 1/4"=1'-0" scale showing the exact point of penetration of floors, walls, and ceilings for all services required to operate the equipment that the Contractor shall furnish. These drawings shall also show dimensioned locations of final connections to equipment. Indicate floor drains, floor sinks, receptacles, lights, and other equipment requirements.
   3. Prepare separate dimensioned drawings at 1/4"=1'-0" scale showing the location and size of all bases, depressions, special height walls, location of equipment

requiring structural support in the walls, openings in walls for equipment, and critical dimensions.

4. All equipment specified for fabrication shall be detailed and fully dimensioned to a minimum scale of 3/4"=1'-0" for plan and elevation views and 1-1/2"=1'-0" for sections.

C. Wiring Diagrams: Details of wiring for power, signal, and control systems and differentiating between manufacturer-installed and field-installed wiring.

D. Piping Diagrams: Details of piping systems and differentiating between manufacturer-installed and field-installed piping.

E. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for exposed products with color finishes.

F. Samples for Verification: Of each type of exposed finish required, minimum 4-inch- (100-mm-) square or 6-inch- (150-mm-) long sections of linear shapes and of same thickness and material indicated for work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

G. Product Certificates: Signed by manufacturers of refrigeration systems or their authorized agents certifying that systems furnished comply with requirements and will maintain operating temperatures indicated in the areas or equipment that they will serve.

H. Maintenance Data: Operation, maintenance, and parts data for food service equipment to include in the maintenance manuals specified in Division 1. Include a product schedule as follows:

1. Product Schedule: For each food service equipment item, include item number and description indicated in Contract Documents, manufacturer's name and model number, and authorized service agencies' addresses and telephone numbers.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing food service equipment, who has completed installations similar in design and extent to that indicated for this Project, and who has a record of successful in-service performance.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing food service equipment similar to that indicated for this Project and with a record of successful in service performance.

C. Source Limitations: Obtain each type of food service equipment through one source from a single manufacturer.

D. Product Options: Drawings indicate food service equipment based on the specific products indicated. Other manufacturers' equipment with equal size and performance characteristics may be considered. Refer to Division 01 Section 23 "Alternates."

E. Regulatory Requirements: Comply with the following National Fire Protection Association (NFPA) codes:
   1. NFPA 54, "National Fuel Gas Code."
   2. NFPA 70, "National Electrical Code."
   3. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations”

F. Listing and Labeling: Provide electrically operated equipment or components specified in this Section that are listed and labeled.
   1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
   2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

G. AGA Certification: Provide gas-burning appliances certified by the American Gas Association (AGA).

H. ASME Compliance: Fabricate and label steam-generating and closed steam-heating equipment to comply with ASME Boiler and Pressure Vessel Code.

I. ASHRAE Compliance: Provide mechanical refrigeration systems complying with the American Society of Heating, Refrigerating and Air-Conditioning Engineers' ASHRAE 15, "Safety Code for Mechanical Refrigeration".

J. NSF Standards: Comply with applicable NSF International (NSF) standards and criteria and provide NSF Certification Mark on each equipment item, unless otherwise indicated.

K. ANSI Standards: Comply with applicable ANSI standards for electric-powered and gas burning appliances; for piping to compressed-gas cylinders; and for plumbing fittings, including vacuum breakers and air gaps, to prevent siphonage in water piping.

L. SMACNA Standard: Where applicable, fabricate food service equipment to comply with the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) "Kitchen Equipment Fabrication Guidelines," unless otherwise indicated.

M. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section 31 “Project Management” relating to project meetings. Review methods and procedures related to food service equipment including, but not limited to, the following:
   1. Review access requirements for equipment delivery.
   2. Review equipment storage and security requirements.
   3. Inspect and discuss condition of substrate and other preparatory workContractor.
   4. Review structural loading limitations.

5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver food service equipment as factory-assembled units with protective crating and covering.

B. Store food service equipment in its original crating and protective covering. Store in a dry location.

C. Reused Equipment: Coordinate and show sizes, utilities, and other requirements as determined by inspecting equipment noted as existing to be reused. Include all costs for tagging, marking, removing, storing, cleaning, redelivering and installing such equipment. Provide, if specified, accessories necessary for the equipment to conform with the new application. All requirements within the contract documents apply to reused equipment as if contractor furnished, except warranties.

D. Items indicated as Owner Furnished Contractor Installed (OFCI), the contractor shall coordinate space, cutouts in, and utilities while also receiving, protecting, setting on place, cleaning to health department standards, and demonstrating.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish required dimensions and proceed with fabricating equipment without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.7 COORDINATION

A. Coordinate equipment layout and installation with other work including light fixtures, HVAC equipment, and fire-suppression system components.

B. Coordinate location and requirements of service-utility connections.

C. Coordinate size, location, and requirements of concrete bases, positive slopes to drains, floor depressions, and insulated floors. Concrete, reinforcement, and formwork requirements are specified in Division 03 30 "Cast-in-Place Concrete.”

D. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section 72 "Roof Accessories."

1.8 SPECIFIC WORK BY CONTRACTOR

A. All rough-in plumbing, steam, electrical, and ventilation work required in connection with this equipment called for in Itemized Specifications and detailed data.

B. Final connection from the roughing-in point to the various pieces of equipment requiring such connections, and the supplying of all necessary materials and labor for this work shall be the responsibility of the Contractor.

C. Electrical work provided by the Contractor:
   1. Furnish and install all rough-in wiring for foodservice equipment, including convenience receptacles at walls. All electrical convenience receptacles shall be provided by the Contractor. All receptacles shall include stainless steel face plates.
   2. Furnish and install all wiring and conduit between rough-in points and connection points on equipment, making connection thereto in accordance with wiring diagrams and/or information furnished by the food service equipment manufacturers.
   3. Furnish and install all required disconnect switches and/or junction boxes between building utilities, rough-in points and connection points on equipment.
   4. Furnish and install shunt trip breakers for equipment under fire suppression system and connect to system control panel.
   5. Furnish and install all electrical wiring required between remote refrigeration system(s) and their respective evaporator coils.
   6. Furnish and install all electrical wiring between foodservice equipment control panels and their respective equipment connections, such as disposals, exhaust hoods, etc.
   7. Furnish and install all electrical wiring between fire suppression control systems and building alarm, notification, and control systems.

D. Plumbing work provided by the Contractor:
   1. All exposed piping and fittings shall be type "L" copper painted with 3 coats of high-grade stainless/steel paint. Non-exposed piping to be copper.
   2. Furnish and install all rough-in piping for hot and cold water supply and waste line service to foodservice equipment, including slurry and return water lines for any waste pulping equipment.
   3. Furnish and install all hot and cold water piping, with shut-off valve in each line and pressure reducers where required, and make final connections.
   4. Furnish and install all waste piping, tailpieces, waste traps, steam traps, strainers, vents, etc., and make final connection to waste outlet on equipment.
   5. Furnish and install steam pressure-reducing valves where necessary for proper operation of steam equipment as stated in the item specifications.
   6. If code requires that walk-in panel structures have internal building sprinkler water lines and heads, all piping, drops, and heads shall be provided by the Contractor. Contractor shall also be responsible for drilling all panel access holes and re-

insulating and sealing holes upon completion of the installation. Locations for such holes and drops shall be field coordinated by Contractor.

7. Install gas shut-off, and solenoid valve provided as a part of the fire suppression system.

E. Ventilation work provided by the Contractor:

1. Make final connection between building ventilation duct-work and connection collars as provided with foodservice equipment. Exposed ducts to be fabricated in stainless steel and provided by Contractor to +/-4" above ceiling.

F. Any sleeves required for refrigeration shall be furnished by Contractor. The mounting and connection of the refrigeration system between units and remote compressors will be done by the Contractor. The Contractor will also be responsible for final electrical and plumbing connections of refrigeration systems to building services, including heat trace wiring required for evaporator coil drain lines at all walk-in freezers.

G. Contractor must see that all lines are flushed free of foreign matter before fixtures are connected.

H. The Contractor shall provide all concrete bases, curbs, and recesses as detailed in the item specifications and on the Food Service Special Conditions plans.

1.9 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Refrigeration Compressor Warranty: Submit a written warranty signed by manufacturer agreeing to repair or replace compressors that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Breakage.
2. Faulty operation.

C. Warranty Period: 5 years from date of Substantial Completion for refrigeration compressors. All other equipment provided shall include a one-year warranty covering all parts and labor, plus any extended warranties as normally provided by individual manufacturers. All equipment including refrigeration systems both self-contained and remote shall be warrantied by the installer on the project for one year as indicated in the preceding sentence. The warranty begins the first day of the first year the equipment is put into operation by the Owner of the facility.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet, Strip, Plate, and Flat Bar: ASTMA666, Type304, stretcher leveled, and in finish specified in “Stainless Steel Finishes” article 2.6.

B. Stainless-Steel Tube: ASTMA554, GradeMT-304, and in finish specified in "Stainless-Steel Finishes" Article 2.6.

C. Zinc-Coated Steel Sheet: ASTMA653, G115 coating designation; commercial quality; cold rolled; stretcher leveled; and chemically treated.

D. Zinc-Coated Steel Shapes: ASTMA36 zinc-coated according to ASTMA123 requirements.

E. Plastic Laminate: Complying with NEMALD3 and NSF35 requirements; NSF certified for end-use application indicated; 0.050 inch (1.27 mm) thick for horizontal and vertical surfaces and 0.042 inch (1.07 mm) thick for post-formed surfaces; smooth texture; and easily cleanable.

F. Color: As selected by Architect from manufacturer's full range of colors.

G. Plywood and Lumber: Provide plywood and lumber as specified in Division 06 "Wood, Plastics, and Composites."

H. Sealant: ASTMC920; Type S, Grade NS, Class 25, Use NT. Provide elastomeric sealant NSF certified for end-use application indicated. Provide sealant that, when cured and washed, meets requirements of Food and Drug Administration's 21CFR, Section-177.2600 for use in areas that come in contact with food.
   1. Color: As selected by Architect from manufacturer's full range of colors.
   2. Backer Rod: Closed-cell polyethylene, in diameter larger than joint width.

I. Tempered Glass: ASTMC1048, Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent), Class1 (clear), Qualityq3 (glazing select). Provide products complying with ANSIZ97.1, manufactured by horizontal (roller-hearth) process, and 6 mm thick, unless otherwise indicated. Provide exposed safety edges, if any, seamed before tempering.

J. Plastic: Except for plastic laminate, provide plastic materials and components complying with NSF51.

K. Sound Dampening: NSF-certified 3 mm thick tape-type sound-deadening material by 3-M or equal for use between metal support structures and underside of metal work surfaces.

L. Gaskets: NSF certified for end-use application indicated; of resilient rubber, neoprene, or PVC that is nontoxic, stable, odorless, nonabsorbent, and unaffected by exposure to foods and cleaning compounds.

2.2 ACCESSORIES

A. Cabinet Hardware: Provide NSF-certified stainless steel hardware for equipment items as indicated.

2.3 CUSTOM FABRICATION, GENERAL

A. Fabricate food service equipment according to NSF2 requirements. Use factory assembled components to greatest extent possible.

B. Plastic-Laminate and Wood Casework: Fabricate in accordance with Division 06 "Wood, Plastics, and Composites."

C. Welding: Use welding rod of same composition as metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Provide ductile welds free of mechanical imperfections such as gas holes, pits, or cracks.
   1. Welded Butt Joints: Provide full-penetration welds for full-joint length. Make joints flat, continuous, and homogenous with sheet metal without relying on straps under seams, filling in with solder, or spot welding.
   2. Grind exposed welded joints flush with adjoining material and polish to match adjoining surfaces.
   3. Where fasteners are welded to underside of equipment, finish reverse side of weld smooth and undepressed.
   4. Coat unexposed stainless-steel welded joints with suitable metallic-based paint to prevent corrosion.
   5. After zinc-coated steel is welded, clean welds and abraded areas and apply SSPC-Paint20, high-zinc-dust-content, galvanizing repair paint to comply with ASTMA-780.

D. Fabricate field-assembled equipment prepared for field-joining methods indicated. For metal butt joints, comply with referenced SMACNA standard, unless otherwise indicated.

E. Where stainless steel is joined to a dissimilar metal, use stainless-steel welding material or fastening devices.

F. Form metal with break bends that are not flaky, scaly, or cracked in appearance; where breaks mar uniform surface appearance of material, remove marks by grinding, polishing, and finishing.

G. Sheared Metal Edges: Finish free of burrs, fins, and irregular projections.

H. Provide surfaces in food zone, as defined in NSF2, free from exposed fasteners.

I. Cap exposed fastener threads, including those inside cabinets, with stainless-steel lock washers and stainless-steel cap (acorn) nuts.

J. Provide pipe slots on equipment with turned-up edges and sized to accommodate service and utility lines and mechanical connections.

K. Provide enclosures, including panels, housings, and skirts, to conceal service lines, operating components, and mechanical and electrical devices including those inside cabinets, unless otherwise indicated.

2.4 STAINLESS STEEL EQUIPMENT

A. Edges and Backsplashes: Provide equipment edges and backsplashes indicated complying with referenced SMACNA standard, unless otherwise indicated.

B. Sound Dampening: NSF-certified 3 mm thick tape-type sound-deadening material by 3-M or equal for use between metal support structures and underside of metal work surfaces.

C. Tables: Fabricate with reinforced tops, legs, and reinforced undershelves or cross bracing to comply with referenced SMACNA standard, unless otherwise indicated, and as follows:
1. Tops: Minimum 0.0781-inch- (1.984-mm-) (14 Gauge) thick stainless steel, unless otherwise indicated.
2. Legs: 1-5/8 inch (41.3 mm) OD, minimum 0.0625-inch- (1.588-mm-) (16 Gauge) thick stainless steel with stainless-steel gusset and adjustable insert bullet-type feet with minimum adjustment of 1 inch (25 mm) up or down without exposing threads, unless otherwise indicated.
3. Undershelves: Minimum 0.0625-inch- (1.588-mm-) thick stainless steel, unless otherwise indicated.
4. Top and Undershelf Reinforcement: Provide minimum 0.0781-inch- (1.984-mm-) thick, stainless steel reinforcing, unless otherwise indicated.
5. Cross Bracing: 1-1/4 inch (31.75 mm) OD, minimum 0.0625-inch- (1.588-mm-) thick stainless steel, unless otherwise indicated.

D. Sinks: Fabricate of minimum 0.0781-inch- (1.984-mm-) thick stainless steel with fully welded, 1-piece construction. Construct 2 sides and bottom of sink compartment from 1 stainless-steel sheet with ends welded integral and without overlapping joints or open spaces between compartments. Provide double-wall partitions between compartments with 1/2-inch- (13-mm-) radius rounded tops that are welded integral with sink body. Cove horizontal, vertical, and interior corners with 3/4-inch (19-mm) radius. Pitch and crease sinks to waste for drainage without pooling. Seat wastes in die-stamped depressions without solder, rivets, or welding.
1. Wastes: 2-inch (50-mm) nickel-plated bronze, rotary-handle waste assembly with stainless-steel strainer plate and nickel-plated brass, connected overflow.
2. Drainboards: Minimum 0.0781-inch- (1.984-mm-) thick stainless steel, pitched to sink at 1/8 inch per 12 inches (3 mm/300 mm) of length. Reinforce drainboards

with minimum 0.0781-inch- (1.984-mm-) thick stainless steel 1-1/4" angle, unless otherwise indicated.

3. Legs: 1-5/8 inch (41.3 mm) OD, minimum 0.0625-inch- (1.588-mm-) thick stainless steel with stainless-steel gusset welded to 0.1094-inch- (2.779-mm-) thick, stainless steel support plate. Provide adjustable insert bullet-type feet with minimum adjustment of 1 inch (25 mm) up or down without exposing threads, unless otherwise indicated.
4. Drainboard Braces: 1 inch (25 mm) OD, minimum 0.0625-inch- (1.588-mm-) stainless steel tube for drainboard lengths longer than 24" (600 mm), unless otherwise indicated.
5. Cross Bracing: 1-1/4 inch (31.75 mm) OD, minimum 0.0625-inch- (1.588-mm-) thick stainless steel, unless otherwise indicated.

E. Wall Shelves and Overshelves: Fabricate to comply with referenced SMACNA standard, unless otherwise indicated, and with minimum 0.0625-inch- (1.588-mm-) thick, stainless steel shelf tops.

F. Drawers: Provide lift-out type, 1-piece, die-stamped drawer pan fabricated from 0.050-inch- (1.27-mm-) thick stainless steel with inside corners formed with proper radius. Support drawer pan with 0.0625-inch- (1.588-mm-) thick, stainless steel channel frame welded to drawer front. Provide 1-inch- (25-mm) thick, double-wall front fabricated from 0.0625-inch- (1.588-mm-) thick stainless steel and with integral recessed pull. Fill void in drawer front with semi-rigid fiberglass sound dampening. Mount drawers on NSF-certified, full-extension, stainless steel drawer slides that have minimum 100-lb (45-kg) load capacity per pair, ball-bearing rollers, and positive stop. Mount drawer slides for self-closing on drawer housing as indicated.

2.5 EXHAUST HOOD FABRICATION

A. General: Fabricate hoods indicated from minimum 0.050-inch- (1.27-mm-) thick stainless steel, unless otherwise indicated. Comply with NFPA96 and requirements of authorities having jurisdiction.
1. Refer to Division 23 Sections for duct, fan, damper, and fire-extinguishing system requirements.

B. Exhaust-Duct Collars: Minimum 0.0625-inch- (1.588-mm-) thick stainless steel.

2.6 STAINLESS-STEEL FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
1. Remove or blend tool and die marks and stretch lines into finish.
2. Grind and polish surfaces to produce uniform, directional textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

B. Concealed Surfaces: No.2B finish (bright, cold-rolled, unpolished finish)

C. Exposed Surfaces: No.4 finish (bright, directional polish).

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

E. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

2.7 ELECTRICAL AND MECHANICAL REQUIREMENTS

A. Standard UL listed materials, devices, and components shall be selected and installed in accordance with NEMA Standards and recommendations and as required for safe and efficient use and operation of the foodservice equipment without objectionable noise, vibration, and sanitation problems.
   1. Provide recognized commercial grade signals, "on-off" pushbuttons or switches, and other speed and temperature controls as required for operation of each item, complete with pilot lights and permanent engraved, plastic laminate signs and graphics identifying each item. Provide stainless steel cover plates at controls and signals.
   2. Each item requiring electrical power shall be equipped with either a terminal box for permanent connection or with cord and plug for interruptible connection, as indicated. Provide NEMA standard grounding-type plugs, where used.
   3. Furnish all foodservice equipment completely wired internally using wire and conduit suitable for wet locations, including a separate grounding wire.
   4. Provide Hubbell three-wire or four-wire grounding-type connectors and neoprene cords installed on each item of plug-in equipment. Coordinate the work with the Contractor so that the receptacles provided match the specific plugs provided as part of the plug-in equipment. Reduce the length of all cords furnished with the specified equipment to a suitable or appropriate length and so they do not interfere with other equipment or foodservice operations.
   5. All electrically heated equipment shall be internally wired to a thermostatic control and an "on-off" red neon light indicator, which shall be mounted in a terminal box on a removable stainless steel access panel.
   6. Only rigid steel conduit shall be used, zinc-coated where unexposed and chrome-plated where exposed. All wiring shall be run concealed wherever possible.
   7. Provide on or for each motor-driven appliance or electrical heating or control unit, a suitable control switch or starter of the proper type and rating and in accordance with Underwriters Code wherever such equipment is not built in. All other line switches, safety cut-outs, control panels, fuse boxes, other control fittings, and connections, when not an integral part of the unit or furnished loose by the equipment manufacturer shall be furnished and installed with electrical work unless otherwise specified. All electrical controls, switches, or devices provided loose for field installation as a part of the item specified shall be installed in the field by the Contractor unless otherwise specified.
   8. All equipment furnished shall be so wired, wound, or constructed so as to conform with the characteristics of electrical and other services at the job site.

9. Appliances shall be furnished complete with motors, driving mechanism, starters, and controllers, including master switches, timers, cut-outs, reversing mechanism, and other electrical equipment if and as applicable. Wiring and connection diagrams shall be furnished with electrically operated machines and for all electrically wired fabricated equipment.
10. Appliances shall be of rigid construction, free from objectionable vibration. Quietness of operation of all foodservice equipment is a requirement. Remove or repair any equipment producing objectionable noise and/or vibration as directed by the Architect.
11. Motors shall be of the drip-proof, splash proof, or totally enclosed type, having a continuous duty cycle and ball bearings, except small timing motors which may have sleeve bearings. All motors shall have windings impregnated to resist moisture. Motors located where subject to deposits of dust, lint, or other similar matter from the machine on which installed shall be of the totally enclosed type. Motors shall have ample power to operate the machines for which designated under full load operating conditions without exceeding their nameplate ratings. Horsepower requirements on driven equipment shall be determined by the manufacturer based on normal operation at maximum capacity. The nominal rated motor horsepower shall be not less than the horsepower required for normal operation of the equipment at maximum capacity. Insulation shall be NEMA Class B, or better.
12. All switches, controls, etc., shall be conspicuously labeled as to use with plastic nameplates secured to the adjacent surface as previously specified in Article 2.01-C. Submit a sample for approval.
13. Where specified for custom fabricated equipment, provide a compartment with electrical sub-panel that shall be pre-wired in conduit concealed in cabinet body construction and connected to all electrical components built into or set upon the counter. Electrical sub-panel shall be UL listed, 3-phase, 4-wire circuit breaker type with a ground buss main breaker and individual breakers for each serviced load. All buss shall be copper and the circuit breakers shall be the molded case, bolt-on type with thermomagnetic quick-make, quick-break trip. Multi-pole circuit breakers shall have an internal trip bar. The circuit breakers shall have an interrupting capacity of 10,000 amperes at 120 volts and there shall be a separate breaker for each connected load. Each breaker shall be sized for 125% of the connected load and a minimum of two (2) extra, single pole, 20 amp circuit breakers shall be provided. The loads shall be connected through the breakers in a phased sequence to balance the load on each phase. Main connection to the panel shall be made with electrical work.

B. Water inlets shall be located above the positive water level wherever possible to prevent siphoning of liquids into the water supply system. Wherever conditions shall require a submerged inlet, a suitable type of check valve (except in jurisdictions where check valves are prohibited) and vacuum breaker shall be provided with the fixture to prevent siphoning. Where exposed, piping and fittings shall be chrome-plated. Where vacuum breaker piping is through equipment, provide chrome -plated escutcheon plates to cover holes.

1. Provide and install indirect waste lines from equipment which shall discharge into floor drains or safe wastes, chrome-plated where exposed. Extend to a point at least 1" (or as required by local or state code) above the rim of the floor drain, cut bottom on 45-degree angle and secure in position.
2. All horizontal-piping lines shall be run at the highest possible elevation and not less than 6" above the floor, through equipment where possible.
3. No exposed piping in or around fixtures or in other conspicuous places shall show tool marks or more than one thread at the fitting.
4. All steam operating valves on or in fabricated and purchased foodservice equipment shall be provided with composition hand wheels, which shall remain reasonably cool in service.
5. Provide suitable pressure-reducing valves for all equipment with such components that might reasonably be expected to be affected over a period of time by adverse pressure conditions, including but not limited to dishwashers, booster heaters, coffee urns, steam boilers, etc.

C. Provide and install complete refrigeration systems--charged, started, and operating properly--including, but not limited to: compressors, condensers, racks, coils, vibration eliminators, sight glasses (moisture indicating type), expansion valves, filters, oil separators, thermostats, defrost time clocks, all controls and control wiring, liquid line driers, piping, and refrigeration grade copper tubing with all sweat joints using Safety-Silv No.1200 (with as few joints as possible).
   1. Where specifications call for pre-piped lines (i.e., from a fixture to a valve compartment, etc.), provide such work in strict conformance with other sections of the specifications which set forth standards for this type of work or in conformity with the requirements of the Board of Fire Underwriters or ASHRAE Standards, whichever is the greater.
   2. All mechanically refrigerated cold pans shall have a normally closed liquid line electric solenoid valve installed before the expansion valve and wire to a silent-type toggle switch complete with an "on-off" red neon light indicator and both mounted in a terminal box on a removable access panel. This switch shall be fed by a separate control circuit and shall not to be wired into the compressor circuit so that it shall stop the flow of refrigerant to the cold pan and not turn off the compressor. The compressor shall then pump down and turn off through the action of the pressure control.
   3. Each refrigeration item specification is written to provide minimum specifications and scope of work. All refrigeration equipment shall be designed and installed to maintain the following general temperatures unless otherwise specified.
      a. Walk-in Refrigerators +35ºF./1.7ºC.
      b. Walk-in Freezers -10ºF./-23.3ºC.
      c. Reach-in Refrigerators +35ºF./1.7ºC.
      d. Reach-in Freezers -10ºF./-23.3ºC.
      e. Undercounter Refrigerators +35ºF./1.7ºC.
      f. Undercounter Freezers -10ºF./-23.3ºC.
      g. Cold Pan +0ºF./-17.8ºC.

4. Provide (including payment if subcontracted) all electrical and refrigeration components needed for complete refrigeration systems and complete all connections of and to said components.
5. An evaporator coil defrost system shall be provided and installed by the Contractor on all walk-in refrigerator and freezer rooms where the refrigeration systems are designed to operate at room temperature of less than 35°F.
6. Verify the requirements of and provide any or all additional refrigeration specialty(s) or component(s) required or recommended by the manufacturer for proper operation under the specific operating conditions and location of each system specified.
7. Verify and provide manufacturer's certification (or certification by manufacturer's authorized agent) that the equipment selection hereinafter specified for each refrigeration system is properly sized and shall meet the operating requirements set forth for each system regarding maintaining specified operating temperature, hours of compressor running time, and system pressures and velocities as recommended by the equipment manufacturer(s).
8. All refrigeration systems shall be installed and wired in strict conformance with the manufacturer's instructions and recommendations. The Contractor shall ensure that all refrigeration condensing units are ventilated properly and are accessible for repair, maintenance, and inspection.
9. Hang the evaporator coils per the manufacturer's recommendation at the locations as shown on the drawings. Unit shall be mounted sloping such that the drain pans are pitched to the drain lines. The coils shall be hung using nylon or other approved non-conductive, non-corrosive fasteners. Unless specified otherwise, coils shall be installed 4" from the interior walk-in ceiling. Furnish #12 gauge galvanized steel fish plates of suitable size and shape on the exterior ceiling of the walk-in to spread the weight of the coils adequately. The coils shall be connected to the condensing unit and the installation shall constitute a complete working system capable of maintaining the interior temperatures specified regardless of the heavy usage the walk-in units may receive.
10. Furnish and install a copper drain line from each coil outlet to a point 1" above the floor drain. Drain lines shall be trapped immediately above the floor drain. The freezer drain line shall be wrapped with a continuous electrified heater tape that shall be furnished as part of the refrigeration system contract. Drain runs inside the walk-in shall be installed in accordance with local codes and in such a manner as to not interfere with shelving and not be susceptible to mechanical damage.
11. Refrigeration tubing shall be the Type L, ACR hard drawn degreased, sealed copper and shall be installed with horizontal runs sloped 1" per 20 feet toward the condensing units. All refrigerant piping shall be properly supported by adjustable hangers spaced and adjusted to the drop required. Where vertical runs of more than 5' occur in the suction line, the risers shall be trapped at the bottom. Piping is to be installed so that refrigerant or oil cannot drain back into the coils from the suction line.
12. All suction and refrigerant lines shall be insulated with minimum 1/2" Armstrong armaflex or equal cellular type insulation. Metal pipe sleeves shall be provided where piping passes through a wall, ceiling, or floor. Space around the tubing shall be filled with mastic insulating compound. Install a permanent suction line filter in

each compressor suction line with pressure fitting ahead of the filter to facilitate checking of pressure drop through the filter. All penetrations through walk-in cooler or freezer structures shall be fully insulated and sealed to be vapor tight to prevent condensation within any light fixtures, switch boxes, junction boxes, or any other fittings. Refrigeration and drain lines shall be fully sealed and provided with escutcheon plates by the installer.

13. Furnish and completely install a thermostat to control the refrigeration temperatures for each individual compartment. The Contractor shall interconnect the blower coils with the condensing unit.
14. The condensing units shall be mounted on a welded steel rack. The rack shall contain all of the accessories and components necessary to form a complete condensing unit package. Each condensing unit shall have a factory mounted, pre-wired control panel/disconnect switch complete with circuit breakers, contactors, and time clocks as required.
15. The Contractor shall be responsible during check out and initial operation to make sure that:
    a. All controls are properly adjusted, including refrigeration circuits, room air temperature controls, etc.
    b. All condensers carry an overload protector.
    c. That a competent service mechanic is available during the first eight (8) hours of operation.
    d. That all switches, starters, and controls are identified as to function.
16. The refrigeration systems shall be furnished with a one-year refrigeration service contract, covering all parts and labor, with service available seven days per week, 24-hours per day. Continuation of the service contract after the first year shall be at the option of the Owner. The refrigeration system shall be warranted for one year and the compressors shall carry the manufacturer's extended five-year warranty.
17. Furnish four (4) copies of complete remote refrigeration system control wiring and piping diagrams. One (1) copy shall be framed in Plexiglas and mounted at compressor location.
18. Unless otherwise specified, all thermometers for walk-in units shall be furnished with suitable length armored capillary tubes to allow the sensing bulb to be installed in the incoming air stream to the blower coil with all runs fastened to the walk-in walls to prevent it from damage. This identical requirement applies to alarm systems when specified.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections, and other conditions affecting installation and performance of food service equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine roughing-in for piping, mechanical, and electrical systems to verify actual locations of connections before installation.

3.2 INSTALLATION, GENERAL

A. Install food service equipment level and plumb, according to manufacturer's written instructions, original design, and referenced standards.

B. Complete equipment field assembly, where required, using methods indicated.
   1. Provide closed butt and contact joints that do not require filler.
   2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in "Fabrication, General" Article.

C. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.

D. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.

E. Except for mobile and adjustable-leg equipment, securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners, unless otherwise indicated.

F. Install hoods to comply with NFPA96 requirements and to remain free from vibration when operating.

G. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 48 inches (1200 mm) o.c. maximum.

H. Install sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.

3.3 PROTECTING

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure food service equipment is without damage or deterioration at the time of Substantial Completion.

3.4 COMMISSIONING

A. Startup Services: Engage factory-authorized service representatives to perform startup services and to demonstrate and train Owner's maintenance personnel as specified below.
   1. Coordinate food service equipment startup with service-utility testing, balancing, and adjustments. Do not operate steam lines before they have been cleaned and sanitized.

2. Remove protective coverings and clean and sanitize equipment, both inside and out, and re-lamp equipment with integral lighting. Where applicable, comply with manufacturer's written cleaning instructions.
3. Test each equipment item for proper operation. Repair or replace equipment that is defective in operation, including units that operate below required capacity or that operate with excessive noise or vibration.
4. Test refrigeration equipment's ability to maintain specified operating temperature under heavy-use conditions. Repair or replace equipment that does not maintain specified operating temperature.
5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
6. Test motors and rotating equipment for proper rotation and lubricate moving parts according to manufacturer's written instructions.
7. Test water, drain, gas, steam, oil, refrigerant, and liquid-carrying components for leaks. Repair or replace leaking components.
8. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance for each food service equipment item.
9. Review data in the operation and maintenance manuals. Refer to Division 01 Section 70 “Execution and Closeout Requirements."
10. Review data in the operation and maintenance manuals. Refer to Division1 Section "Operation and Maintenance Data."
11. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

3.5 SCHEDULE OF EQUIPMENT

A. In the case of a discrepancy between the contract drawings and specifications, the greater quantity, more stringent, or more costly alternative shall be used as the basis of cost.

B. Equipment that has received the EPA “Energy Star” rating shall be provided where possible.

C. Contractor shall refer to the food service plans and equipment schedules within the drawings for CFCI (Contractor Furnished/Contractor Installed) and OFCI (Owner Furnished/Contractor Installed) items.

D. Refer to Paragraph 1.5.D for the disposition of Owner or Vendor-supplied equipment.

ITEM # 1.01	WALK IN COOLER
Quantity:	One (1)
Manufacturer:	ThermalRite
Model:	CUSTOM

Pre-fabricated modular panel box of size and configuration shown in Contract

Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 8’ 6” inside ceiling height
Served by Items 1.02 and 3.01
Floor Construction: No floor
Finish Interior and Exterior Walls and Ceiling: 26 gauge White Stucco Embossed Galvanized Steel, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Finish Unexposed Exterior Walls: 26 gauge Stucco Embossed Galvanized Steel
Quantity (1) 34” x 78” Flush Mounted Entrance Door
Door in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (1) set Bi-swing vinyl doors
Quantity (1) Extra vapor-proof LED light fixture
Quantity (1) Everidge Smartrite Monitor to include:
Refrigeration System Monitor and Controller mounted on front panel of walk-in beside the door
Touch screen monitor features a TFT display with full color, hi-resolution graphics
Where specified, controls walk-in lights, door and Vu-Port heaters
Monitors walk-in temperature and relative humidity monitoring/logging for up to two compartments, with on-board data storage and auto roll-over
Audio-visual alarms, with remote annunciation/notification capabilities
Door open monitor/alarm
High/low temperature alarm
Panic/entrapment alarm
Power failure alarm/monitoring
Battery backup
Real-time clock with auto daylight saving
Bluetooth and WiFi capabilities with proprietary smartphone app
Third-party BAS system compatibility

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 1.02	EVAPORATOR COIL, +35F
Quantity:	One (1)
Manufacturer:	ThermalRite
Model:	LEL0095AS6AMAB0200

35 degree F operating temperature
Coupled with Item 1.08 for full refrigeration system

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 1.03 HIGH DENSITY SHELVING
Quantity: One (1)
Manufacturer: Metro
Model: TT-MAXQ

Each system to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
One (1) Model TTS13NA Super Erecta®, MetroMax® Q™ Top-Track Track Set, 13 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF
One (1) Model MXTTE24 MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports & hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Three (3) Model MXTTM21C MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Twelve (12) Model MQ2160G MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Eight (8) Model MQ2460G Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 1.04 HIGH DENSITY SHELVING
Quantity: Two (2)
Manufacturer: Metro
Model: TT-MAXQ

System to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
Two (2) Model TTS15NA Super Erecta®, MetroMax® Q™ Top-Track Track Set, 15 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF
Two (2) Model MXTTE24 MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports &

hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Eight (8) Model MXTTM21C MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Thirty-Two (32) Model MQ2160G MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Sixteen (16) Model MQ2460G Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 1.05 SHELVING, UNIT
Quantity: Twelve (12)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Four (4) Model MQ2142G Quick Ship - MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Twelve (12) Model MQ2148G Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Twenty-four (24) Model MQ2154G MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Eight (8) Model MQ2160G MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Forty-eight (48) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection

Twenty-four (24) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Twenty-four (24) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 1.06 OPEN NUMBER

ITEM # 1.07 OPEN NUMBER

ITEM # 1.08 REMOTE REFRIGERATION SYSTEM
Quantity: One (1)
Manufacturer: ThermalRite
Model: LCH0010MBACZA0000

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 1.01 and 1.02
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 2.01 REFRIGERATOR, REACH-IN
Quantity: One (1)
Manufacturer: Continental Refrigerator
Model: D2RNSA

Designer Line Refrigerator, reach-in, two-section, self-contained refrigeration, stainless steel exterior, aluminum interior, stainless steel front, standard depth cabinet, full-height stainless steel doors, cylinder locks, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/3 HP, cETLus, NSF, ENERGY STAR®
Left door hinged on left & right door hinged on right, standard

One (1) set Model 50205-4 Casters, swivel, with brakes (4" diameter rubber tires) set of 4 (5" height)

ITEM # 2.01A REFRIGERATOR, REACH-IN
Quantity: Two (2)

EXISTING / RELOCATED

ITEM # 2.02 SHELVING, UNIT
Quantity: Five (5)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Twelve (12) Model MQ2154G MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Eight (8) Model MQ2160G MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Twenty (20) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Ten (10) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Ten (10) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.03 SHELVING, UNIT
Quantity: Seven (7)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes

Four (4) Model MQ2136G MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Sixteen (16) Model MQ2142G MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Eight (8) Model MQ2148G MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Twenty-Eight (28) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Fourteen (14) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Fourteen (14) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.04 HIGH DENSITY SHELVING
Quantity: Two (2)
Manufacturer: Metro
Model: TT-MAXQ

System to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
One (1) Model TTS20NA Super Erecta®, MetroMax® Q™ Top-Track Track Set, 20 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF (Actual length: 19’6”)
One (1) Model MXTTE24 MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports & hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Six (6) Model MXTTM21C MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Twenty-four (24) Model MQ2160G MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner

releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Eight (8) Model MQ2460G Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.05 WALK IN COOLER/FREEZER
Quantity: One (1)
Manufacturer: ThermalRite
Model: CUSTOM

Pre-fabricated modular panel box of size and configuration shown in Contract Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 8’6” ceiling height inside the walk-in
Served by Items 2.06, 2.07, 3.02 and 3.03
Floor Construction: Manufacturer's floor, reinforced for heavy loads with diamond treadplate finish, installed per Detail W.4
Finish Interior and Exterior Walls and Ceiling: 26 gauge White Stucco Embossed Galvanized Steel, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Finish Unexposed Exterior Walls: 26 gauge Stucco Embossed Galvanized Steel
Exterior wall at corridor to have diamond tread 36” high.
Quantity (1) 48” x 78” Flush Mounted Entrance Doors
Doors in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (1) 48” x 78” single leaf sliding door with wall guide system, finish to match walls, 36” diamond tread on exterior.
Quantity (2) sets Bi-parting vinyl doors
Quantity (3) Extra vapor-proof LED light fixture
Quantity (1) Interior ramp with non-skid strips in finish to match walk-in floor
Quantity (1) Everidge Smartrite Monitor to include:
Refrigeration System Monitor and Controller mounted on front panel of walk-in beside the door
Touch screen monitor features a TFT display with full color, hi-resolution graphics
Where specified, controls walk-in lights, door and Vu-Port heaters
Monitors walk-in temperature and relative humidity monitoring/logging for up to two compartments, with on-board data storage and auto roll-over

Audio-visual alarms, with remote annunciation/notification capabilities
Door open monitor/alarm
High/low temperature alarm
Panic/entrapment alarm
Power failure alarm/monitoring
Battery backup
Real-time clock with auto daylight saving
Bluetooth and WiFi capabilities with proprietary smartphone app
Third-party BAS system compatibility

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 2.06 EVAPORATOR COIL, +35F
Quantity: One (1)
Manufacturer: ThermalRite
Model: LEL0115AS6AMAB0200

35 degree F operating temperature
Coupled with Item 3.01 for full refrigeration system

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 2.07 EVAPORATOR COIL, -10F
Quantity: Two (2)
Manufacturer: ThermalRite
Model: LEL0100BS6EEAB0200

Two (2) Model LEL0100BS6EEAB0200 -10 degree F operating temperature
Coupled with Item 3.02 for full refrigeration system

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

ITEM # 2.08 SHELVING, UNIT
Quantity: Four (4)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Four (4) Model MQ2136G MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4)

wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Twelve (12) Model MQ2160G Quick Ship - MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Sixteen (16) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Eight (8) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Eight (8) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.09 SHELVING, UNIT
Quantity: Ten (10)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Four (4) Model MQ2136G MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Four (4) Model MQ2142G MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Sixteen (16) Model MQ2154G Quick Ship - MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Sixteen (16) Model MQ2160G Quick Ship - MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Forty (40) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1"

increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Twenty (20) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Twenty (20) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.10 HAND SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.11 FREEZER, REACH-IN
Quantity: One (1)

EXISTING / RELOCATED

ITEM # 2.12L EXHAUST HOOD WITH MAKEUP AIR
Quantity: One (1)
Manufacturer: Halton
Model: KVE

100% 304 Stainless Steel Construction
Size of Hood: 162” x 69”, with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.17, 2.18 and 2.19
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid

tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

Or Approved Comparable Product by one of the following Manufacturers:
Gaylord, Streivor

ITEM # 2.12R EXHAUST HOOD WITH MAKEUP AIR
Quantity: One (1)
Manufacturer: Halton
Model: KVE

100% 304 Stainless Steel Construction
Size of Hood:162” x 69”, with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.13, 2.15 and 2.16
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

Or Approved Comparable Product by one of the following Manufacturers:
Gaylord, Streivor

ITEM # 2.13 FRYER, GAS
Quantity: One (1)
Manufacturer: Pitco Frialator (Middleby)
Model: SG14RS-2FD

Solstice™ Prepackaged Fryer System with Solstice™ Filter Drawer System, High Power, gas, (2) 50 lb. oil capacity full tanks, millivolt control, stainless steel tank, front & sides, under-fryer drawer filtration, total 244,000 BTU (-FF), NSF, CE, CSA Flame, CSA Star, AuGA
Millivolt Thermostat, standard
Model P6072145 Basket, (2) oblong/twin size, 13-1/2" x 6-1/2" x 5-3/4" deep, long handle, regular mesh (shipped std (n/c) with models "T" SG14, SG14R, SSH55, SE14, SE14X, SE14B, SG14T, 35+, 45+, fryer batteries shipped with (1) per fryer
Model B3901504 Casters, 9" adjustable swivel non-lock rear & lock front casters, for battery of (2) Solstice gas and electric fryers, batteries and retherms
Model B8003106 Gas Connector Hose, 1" connection, 48" long, with quick disconnect couplings, restraining device & thermal shut-off, for multiple units 390,000 BTU

ITEM # 2.14 WORKTABLE
Quantity: One (1)
Manufacturer: Advance Tabco
Model: KSS-363

Work Table, 24"W x 36"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF
Model TA-87 Enclose back of splash: 3’0”
Model TA-25 set Casters, 5", swivel, with rubber wheels (set of 4) (2 with brakes)
Four (4) Model TA-25C X.H.D. Urethane Wheel Upgrade, for TA25A or TA25 casters

ITEM # 2.15 RANGE, GAS
Quantity: One (1)
Manufacturer: Vulcan
Model: V6B36S

V Series Heavy Duty Range, gas, 36", (6) 35,000 BTU open burners, cast iron grates, standard oven, stainless steel front, front top ledge, sides, base, burner box & stub back, 6" adjustable legs, 260,000 BTU, CSA, NSF
One (1) Model CASTERS-ADJRR4 Casters, 6", adjustable (set of 4) (2 with locks)
Model 1INFLEX-4FT 1" X 4' flex hose & quick disconnect with restraining device

ITEM # 2.16 TILT SKILLET, ELECTRIC
Quantity: One (1)
Manufacturer: Vulcan
Model: VPP40E-480

PRECIPAN™ Tilting Braising Pan, electric, 40 gallon usable capacity, multifuntion cooking unit, 80° - 482°F temperature range, multi-zone temperature controlled cooking

& multiple timers, auto mode for programed recipes, manual pan or kettle mode, USB port, food probe ready, strainer, motor driven pan tilt/lift, Auto-lift arm (for use with baskets), auto & precise water fill, powered drain without tilting, retractable spray hose, 480v/60/3-ph, 50.3 amps, 41.9 kW, cULus, NSF (V1BPT15E-36)
Model VPP-STRAINER40 PRECIPAN™ Strainer Kit, for 40 gallon

ITEM # 2.16A FLOOR TROUGH
Quantity: One (1)
Manufacturer: IMC Teddy
Model: ASFT-2436-SG

ASFT Anti-Spill Floor Trough, 36"W x 24"D, 6" deep receptacle, (1) 4" OD tailpiece, stainless steel beehive strainer, 14/304 stainless steel, brushed satin finish, (SG) subway grating, NSF, Made in USA
Model HDCI HydroCool Insert, 18ga type 304 stainless steel, insert has perforated bottom with 1⁄32” seepage holes, 1” x 7½” long overflow holes are provided on both sides of insert, 1¾” wide flanges on length sides, drain tempering valve, flexible hose with water hammer arrestor & backflow preventer, one piece assembly plus the grating section, patent pending, trough sold separately, Made in USA

Or Approved Comparable Product by one of the following Manufacturers:
Streivor, Eagle Group

ITEM # 2.17 CONVECTION OVEN, GAS
Quantity: One (1)

EXISTING / RELOCATED

ITEM # 2.18 COMBI OVEN, ELECTRIC
Quantity: One (1)
Manufacturer: RATIONAL
Model: ICP 6-FULL ON 10-FULL E 480V 3 PH

iCombi Pro® 6-Full Size Combi Oven on one (1) (CE1ERRA.0000222) iCombi Pro® 10-Full Size Combi Oven, double stack, electric, (16) 18" x 26" sheet pan or (32) 12" x 20" steam pan or (16) 2/1 GN pan capacity, (8) stainless steel grids included, intelligent cooking system with (4) assistants; iDensityControl, iCookingSuite, iProductionManager, & iCareSystem, (6) operating modes, (5) cooking methods, (3) manual operating modes, 85° to 572°F temperature range, quick clean, care control, eco mode, 6-point core temperature probe, retractable hand shower, Ethernet interface, Wi-Fi enabled, 480v/60/3-ph, 22.4/37.4 kW, CE, IPX5, UL, cULus, NSF, ENERGY STAR-®
Model 60.74.725 Combi-Duo Stacking Kit for iCombi 6-full size (electric or gas) on iCombi 6- or 10-full size (electric only)
Filtered/treated water provided through Item 2.26

ITEM # 2.19 COMBI OVEN, ELECTRIC
Quantity: One (1)
Manufacturer: RATIONAL
Model: ICP 20-FULL E 480V 3 PH (LM100GE)

iCombi Pro® 20-Full Size Combi Oven, electric, (20) 18" x 26" sheet pan or (40) 12" x 20" steam pan or (20) 2/1 GN pan capacity, mobile oven rack & (10) stainless steel grids included, intelligent cooking system with (4) assistants; iDensityControl, iCookingSuite, iProductionManager, & iCareSystem, (6) operating modes, (5) cooking methods, (3) manual operating modes, 85° to 572°F temperature range, quick clean, care control, eco mode, 6-point core temperature probe, retractable hand shower, Ethernet interface, Wi-Fi enabled, 480v/60/3-ph, 67.9 kW, IPX5, UL, cULus, NSF
Filtered/treated water provided through Item 2.25

ITEM # 2.20 HAND SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.21 FIRE SUPPRESSION SYSTEM
Quantity: One (1)
Manufacturer: Halton
Model: ANSUL R-102 WET CHEMICAL

Wet Chemical System
Stainless steel enclosure with cover for agent tank, release and regulator mechanisms
Location: Wall mounted
Pre-engineered system lines and nozzles to be factory installed by manufacturer of Item(s) 2.12L/R
All exposed piping and fittings to be stainless steel or chrome-plated including piping over the cooking equipment
System to serve Items: 2.13, 2.15, 2.16, 2.17 and 2.19
Manual remote fire pulls located per Code
Electric gas line shut-off valve and pressure switch to shut off electrical power to equipment

Or Approved Comparable Product by one of the following Manufacturers:
Gaylord, Streivor

ITEM # 2.22 HOT HOLDING CABINET, PASS THROUGH
Quantity: Two (2)
Manufacturer: Hatco
Model: FSHC-12W2

Two (2) Model FSHC-12W2 Flav-R-Savor® Humidified Holding Cabinet, (2) Lexan® doors, Pass-thru, (12 pair) universal slides 3" OC adjustable on 1-1/2" OC, stainless steel construction, 5" swivel casters (two swivel with wheels locks, two rigid), NSF, cULus, Made in USA
Two (2) Standard Cord location: facing controls, right hand side panel, lower right corner

ITEM # 2.22A HOT HOLDING CABINET, PASS THROUGH
Quantity: One (1)

FUTURE EQUIPMENT

ITEM # 2.23 REFRIGERATOR, REACH-IN
Quantity: One (1)

EXISTING / RELOCATED

ITEM # 2.24 WORKTABLE
Quantity: Two (2)
Manufacturer: Advance Tabco
Model: SS-305

Two (2) Model SS-305 Work Table, 60"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF
Two (2) sets Model TA-25S-4 Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

ITEM # 2.25 WATER FILTER
Quantity: One (1)
Manufacturer: Everpure
Model: EV979750

KleenSteam® CT System, 6000 gallon capacity, 1.67 gpm flow rate, total system for steamers prevents limescale formation, (1) 4CB5 carbon filter, (1) SS-10 scale inhibitor Cartridge, dip tube, (2) 7 oz. packs ScaleKleen® (EV979750)

Interconnect with water line for Item 2.19

ITEM # 2.26 WATER FILTER
Quantity: One (1)
Manufacturer: Everpure
Model: EV979722

KleenSteam II Twin System, 20,000 gallon capacity, 5.0 gpm flow rate, total system for steamers prevents limescale formation, (2) 7CB5 carbon filters, (1) SS-10 scale inhibitor Cartridge, dip tube, (2) 2.2 lbs. canisters ScaleKleen® (EV979722)
Interconnect with water line for Item 2.18

ITEM # 2.27 SHELVING, UNIT
Quantity: Six (6)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Twenty-Four (24) Model MQ2148G MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Twenty-Four (24) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Twelve (12) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Twelve (12) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.28 OPEN NUMBER

ITEM # 2.45 WALL SHELF
Quantity: One (1)
Manufacturer: Advance Tabco
Model: WS-12-72

Shelf, wall-mounted, 72"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, Custom Fabricated Stainless Steel

ITEM # 2.30 SOILED DISHTABLE W/ THREE COMPARTMENT SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: DTS-D30-84L

Dishlanding-Soil Dishtable, L-shaped with landing, attaches to left of dish machine operator, 10-1/2"H backsplash, with pre-rinse sink, stainless steel legs with crossrails front to back, 83" long, 14/304 stainless steel, Includes prerinse basket with slide bar (slide bar only when K-461 or K-461A disposer adapter is specified)
Model DTA-56 Additional drainboard area on machine side (verify additional length)
Three (3) Model DTA-99E Sink Bowl, 24"W x 24"D x 14" deep, welded into top, (per bowl) (must specify sink location)
Three (3) Model FC-455F Sink Cover, stainless steel, for 24" x 24" fabricated bowl (rests on edges of sink bowl such that the sink cover will be approximately flush with the tabletop or drainboard work surface)
Three (3) Model K-15 Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections
Three (3) Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain
Two (2) Model K-472 Faucet hole revision (each)
Model DTA-79 6'6" Long Double Sided Slant Tubular Rack Sorting Shelf, table mounted (sold per linear foot) (minimum 4 ft), field convertible to allow racks to sit back to back (steeper angle) or one side or the other (lower angle), see spec sheet for details

ITEM # 2.31 OPEN NUMBER

ITEM # 2.32 SWING FAUCET, 12"
Quantity: Two (2)
Manufacturer: T&S Brass
Model: B-0290-04

Big-Flo Mixing Faucet, wall mount, 8" adjustable centers, 12" swing nozzle with plain end outlet, 4" wrist handles with color coded indexes, low-lead, 3/4" female NPT, ANSI, NSF, ADA Compliant

ITEM # 2.33 POT RACK

Quantity: One (1)
Manufacturer: Advance Tabco
Model: SW1-48

Pot Rack, wall-mounted, single bar design, 48" long, with 6 plated double hooks, constructed of 1/4" x 2" stainless steel

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, Custom Fabricated Stainless Steel

ITEM # 2.34 OPEN NUMBER

ITEM # 2.35 OPEN NUMBER

ITEM # 2.36 WAREWASHER, CONVEYOR
Quantity: One (1)
Manufacturer: MEIKO
Model: KA-66

Rack Conveyor Dishwasher, high temperature sanitizing, 66" / 1676mm single-tank design with prewash, 243 racks/hour capacity, 0.29 gallons/1.11 liters per rack, fully automatic operation, glass touch-panel display with graphical and text displays, 3 selectable conveyor speeds, deliming mode, blue color coding for frequently-cleaned components, 3 hp / 2.2 kW wash pump, double wall top, front and rear panels, stainless steel construction, hinged front door with sealing gasket, vent cowlings, connection for external vent fan control, detergent and rinse aid connections, electric tank heat, built-in electric booster heater, PRV, NSF listed, cETLus listed, ENERGY STAR®
Left to right operation
Internal booster heater included, standard
Drain water tempering kit, reduces drain water temperature to below 140°F (60°C), installation by others
Table limit switch with 25' (7.6m) cable, installed in Item 2.37

ITEM # 2.36A VENT DUCT, LOAD END
Quantity: One (1)
Manufacturer: Custom

Fabricated to fit the Load End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

Or Approved Comparable Product by one of the following Manufacturers:
Advance Tabco, Eagle Group

ITEM # 2.36B VENT DUCT, UNLOAD END
Quantity: One (1)
Manufacturer: Custom

Fabricated to fit the Unload End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

Or Approved Comparable Product by one of the following Manufacturers:
Advance Tabco, Eagle Group

ITEM # 2.37 CLEAN DISHTABLE
Quantity: One (1)
Manufacturer: Advance Tabco
Model: DTC-S70-84R

Dishtable, clean, straight design, attaches to right of dish machine operator, 10-1/2"H backsplash, 3" rolled front & side rims, stainless steel legs, with crossrails, 83"W x 30"D x 34"H, 16/304 stainless steel
Model DTA-75 Provision for limit switch, provided as part of Item 2.36

ITEM # 2.38 PRE-RINSE FAUCET
Quantity: One (1)
Manufacturer: T&S Brass
Model: B-0133-01

EasyInstall Pre-Rinse Unit, mixing faucet, 8" wall mount, 14" add-on 063X swing nozzle, 18" riser, overhead spring, lever handles, 56" flex hose, Eterna cartridges, spray valve (B-0107), 9" wall support (B-0109-02), 1/2" male NPT, EPAct2005 Compliant

ITEM # 2.39 HAND SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.40 DISPOSER

Quantity: One (1)
Manufacturer: Salvajor
Model: 300-SA-3-ARSS

Disposer, Sink Assembly, 3-1/2" sink collar, 3 Hp motor, start/stop push button, drain/flush/time delay, automatic reversing & water saving ARSS control, includes fixed nozzle, chrome plated vacuum breaker, solenoid valve, sink stopper & flow control, heat treated aluminum alloy housing, single support leg, UL, CE Model 980105 Mounting bracket for ARSS-2, ARSS, ARSS-LD & WSP

Or Approved Comparable Product by one of the following Manufacturers:
Insinkerator, Hobart

ITEM # 2.41 OPEN NUMBER

ITEM # 2.42 CAN RACK
Quantity: One (1)
Manufacturer: Cambro
Model: EXA243672C96480

Camshelving® Elements XTRA Ultimate #10 Can Rack Stationary Add-On Unit, 24"W x 36"L x 72"H (26"W with can rack overhang), includes: (1) assembled post kits (posts constructed of steel with polypropylene exterior), (9) traverses & molded-in dovetails, (15) can rack panels, (72) can rack brackets, 800 lbs. capacity per shelf /2,400 lbs. max capacity, speckled gray (assembly required) (NOTE: This is a new product line. It is NOT compatible with original Elements Series products.)
Model ESR2436151 (kit) Camshelving® Elements Full Shelf Rail Kit, 24"W x 36"L x 4-1/4"H, includes (2) double level side rails, (2) double level end rails, side & end brackets, polypropylene, soft gray

ITEM # 2.43 BUN PAN RACK
Quantity: Four (4)
Manufacturer: Channel Manufacturing
Model: 400A

Four (4) Model 400A Bun Pan Rack, All-Welded, Standard Heavy-Duty Series, 20.5"W x 26"D x 70.25"H, Aluminum Construction, End Load, 2" Angle Spacing, (30) 18" x 26" or (60) 13" x 18" pans (2 per shelf), 5" Swivel Plate Casters model # CPS45U, Made in USA, NSF, 45lbs. (ITEM WEIGHT ONLY), weight does not include 50 lbs. for pallet weight

ITEM # 2.44 SHELVING, UNIT
Quantity: Six (6)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Eight (8) Model MQ2142G Quick Ship - MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Eight (8) Model MQ2148G Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Eight (8) Model MQ2154G Quick Ship - MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Twenty-Four (24) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Twelve (12) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Twelve (12) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.45 WALL SHELF
Quantity: Two (2)
Manufacturer: Advance Tabco
Model: WS-15-96

Two (2) Model WS-15-96 Shelf, wall-mounted, 96"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, Custom Fabricated Stainless Steel

ITEM # 2.46 TWO COMPARTMENT SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: FS-2-1824-24RL

Fabricated Sink, 2-compartment, 24" right & left drainboards, bowl size 18" x 24" x 14" deep, 14 gauge 304 stainless steel, tile edge splash, rolled edge, 8" OC faucet holes, stainless steel legs with adjustable side cross-bracing, 1" adjustable stainless steel bullet feet, overall 29-1/2" F/B x 84" L/R, NSF
Two (2) Model K-15 Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections
Two (2) Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain
Two (2) Model K-450 Extend drainboard length, (per linear foot. Drainboards exceeding 36” in length with not have a crease or pitch)

ITEM # 2.47 SWING FAUCET, 12"
Quantity: One (1)
Manufacturer: T&S Brass
Model: B-0290-04

Big-Flo Mixing Faucet, wall mount, 8" adjustable centers, 12" swing nozzle with plain end outlet, 4" wrist handles with color coded indexes, low-lead, 3/4" female NPT, ANSI, NSF, ADA Compliant

ITEM # 2.48 WORKTABLE
Quantity: Two (2)
Manufacturer: Advance Tabco
Model: SS-305

Two (2) Model SS-305 Work Table, 60"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF
Two (2) Model TA-25S-4 Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

ITEM # 2.49 WORKTABLE
Quantity: Three (3)
Manufacturer: Advance Tabco
Model: MT-SS-300

Three (3) Model MT-SS-300 Equipment Stand, 30"W x 30"D x 24"H, 14/304 stainless steel top, 18 gauge stainless steel adjustable undershelf & legs, adjustable stainless steel bullet feet, NSF

Three (3) Model TA-25ES Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel for 24" tall tables & mixer stands (capacity 200 lbs per caster)

ITEM # 2.50 WORKTABLE
Quantity: One (1)
Manufacturer: Advance Tabco
Model: SS-306

Work Table, 72"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF
Model TA-25S-4 Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

ITEM # 2.51 FOOD CUTTER
Quantity: One (1)
Manufacturer: Hobart
Model: 84145-18

Food Cutter with #12 attachment hub, 14" diameter stainless steel bowl, 22 RPM, double stainless steel knives, 1725 RPM, bowl cover with safety interlock, push/pull on/off switch, one piece burnished aluminum housing, 3" legs, 115v/60/1-ph, 1/2 HP (available in Canada only)

ITEM # 2.52 MIXER
Quantity: One (1)
Manufacturer: Hobart
Model: HL120-1STD

Bench type mixer; with bowl, beater, & whip; US/EXP configuration - Mixer, Planetary, Bench, 12 quart capacity, (3) fixed speeds plus stir speed, gear-driven transmission, 15-Minute SmartTimer™, #12 taper attachment hub, manual bowl lift, stainless steel bowl, aluminum "B" beater, stainless steel "D" wire whip, stainless steel bowl guard, 1/2 hp, cord with plug

ITEM # 2.53 SLICER, ELECTRIC
Quantity: One (1)
Manufacturer: Hobart
Model: EDGE12-11

Slicer, manual, med duty, angle feed, 12" carbon steel knife, no volt release, poly-v belt drive, permanent ring guard, removable anodized aluminum carriage & knife cover, top mounted sharpener, anodized aluminum finish, 120v/60/1-ph, 4 amp, 1/2 hp, cETLus, NSF (NET)

ITEM # 2.54 FOOD PROCESSOR
Quantity: One (1)
Manufacturer: Robot Coupe
Model: R402A

Combination Food Processor, 4.5 liter stainless steel bowl with handle, continuous feed kit with kidney shaped & cylindrical shaped hoppers, includes: (1) "S" blade (27344), (1) 2mm grating disc (27577), (1) 4mm slicing disc (27566), (1) 10mm dicing kit (28067W), on/off & pulse switch, two speeds, 600 & 1800 RPM, 120v/60/1-ph, 9.0 amps, 2 HP, NEMA 5-15P, cETLus, ETL-Sanitation

ITEM # 2.55 SCALE
Quantity: One (1)
Manufacturer: Hobart
Model: EPSA-1

Access Prepack Stand-alone scale, weighing capacity 50 lb. x .01 lb. (50.09 maximum) for all console models

ITEM # 2.56 OPEN NUMBER

ITEM # 2.57 OPEN NUMBER

ITEM # 2.58 BLAST CHILLER
Quantity: One (1)
Manufacturer: PrepRite by Everidge
Model: PBF15.0

Blast Chiller/Freezer, reach-in, (15) 18" x 26" pan capacity, preloaded recipe catalog, customized programming, hinged door, chill (110 lbs) 194°F to 37°F/90 minutes & freeze (70 lbs) 194°F to 0°F/240 minutes, touch screen controller, self-contained refrigeration system, hot gas defrost, USB interface, HAACP compliant, stainless steel interior & exterior, casters, 208-240v/60/1-ph, ETL, ETL-Sanitation
Model 5386 Single Point Non-Heated Probe, for use with all PrepRite Standalone Blast Chiller/Freezer Units except PBF4.0, included

ITEM # 2.59 WATER FILTER
Quantity: One (1)
Manufacturer: Everpure
Model: EV932401

Insurice® Water Filtration System, Insurice® Single-i2000², Single, (1) i2000² Micro-Pure® II Precoat primary filtration cartridge, reduces chlorine, taste & odor, inhibits scale, outlet pressure gauge, flushing valve, 9,000 gallons, 1.67 gpm, 0.5 micron, 3/8" inlet, 3/8" outlet, NSF 42 & 53 (EV932401)
Interconnect with water line for Item 2.61

ITEM # 2.60 ICE BIN
Quantity: One (1)
Manufacturer: Follett Products, LLC (Middleby)
Model: DEV1010SG-48-75

Ice-DevIce™ with SmartCART™ 75, 1000 lb. bin storage capacity, with front chute, poly liner, SmartGATE ice shield, poly door with PowerHinge™ door hinge, full stainless steel exterior and base, ABS/poly top custom cut for ice machine, includes 82 oz plastic ice scoop, paddle and rake set, and (1) polyethylene cart with hinged lid and (3) polyethylene Totes ice carriers, each carrier holds 25 lb/75 lb total per cart, for cube or Chewblet ice only, NSF

ITEM # 2.61 ICE MACHINE, CUBE
Quantity: One (1)
Manufacturer: Follett Products, LLC (Middleby)
Model: HCD710ABT

Horizon Elite™ Chewblet® ice machine, air-cooled, self-contained condenser, for mounting on Follett ice storage bins, up to 759 lb production of Chewblet® ice in 24 hours, 115v/60/1-ph, NSF, ETL
Model MDD-1003 Remote monitoring with Open Kitchen™, three-year subscription and hardware for first piece of equipment (NET)
Filtered water provided by Item 2.59

ITEM # 2.62 FLOOR TROUGH
Quantity: One (1)
Manufacturer: Advance Tabco
Model: FTG-1842

Floor Trough, 42"W x 18"D x 4" deep, 14 gauge 304 stainless steel, includes stainless steel subway grating constructed from 3/16" x 1" bars, removable stainless steel strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste, NSF
Model FT-1 Anti-Splash Guard, factory installed (per linear foot)

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, IMC Teddy

ITEM # 2.63 WORKTABLE
Quantity: One (1)
Manufacturer: Advance Tabco
Model: KSS-309

Work Table, 108"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF
Model TA-31 Side Splash, 5" high (each)

ITEM # 2.64 WORK SINK, WELD-IN
Quantity: One (1)
Manufacturer: Advance Tabco
Model: TA-11N

Sink Welded Into Table Top, 18"W x 18"D x 14" deep bowl, includes faucet, NSF (must specify sink location)
Install in Worktable, Item 2.63, as shown on Plan

ITEM # 2.65 WORKTABLE
Quantity: One (1)
Manufacturer: Advance Tabco
Model: KSS-307

Work Table, 84"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF
Model TA-61 Modification to reduce length and/or width of table, start with next largest size then add "TA-61" to model number
Model TA-31 Side Splash, 5" high (each)

ITEM # 2.66 COFFEE MACHINE
Quantity: One (1)

EXISTING/TO BE RELOCATED
Interconnect to Item 2.66A Water Filter

ITEM # 2.66A WATER FILTRATION SYSTEM, FOR COFFEE BREWERS
Quantity: One (1)
Manufacturer: Everpure
Model: QC7I SINGLE 4FC5-S

Water Filtration System, QC7I Single 4FC5-S, (1) 4FC5-S Fibredyne® carbon block cartridge, reduces sediment, chlorine, taste & odor, inhibits scale, 15,000 gallons capacity, 2.5 gpm flow rate, 5 micron, inlet water shut-off valve, outlet pressure gauge, flush valve, 3/8" inlet/outlet connections, NSF 42
Interconnect to Item 2.66 Coffee Machine

ITEM # 2.67 SODA MACHINE
Quantity: One (1)

EXISTING/TO BE RELOCATED
Interconnect to Item 2.67A Water Filter

ITEM # 2.67A WATER FILTRATION SYSTEM, FOR COFFEE BREWERS
Quantity: One (1)
Manufacturer: Everpure
Model: EV976111

QC7I Single-XCLM Fountain Filtration System, 5 micron, 1-2 gpm flow rate, rated capacity 9,300 to 19,300 gallons, chloramines reduction, NSF 42
Interconnect to Item 2.67 Soda Machine

ITEM # 2.68 MOP HOLDER
Quantity: One (1)
Manufacturer: Advance Tabco
Model: K-242

Mop Hanger, 23", accommodates (3)

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.69 MOP SINK
Quantity: One (1)
Manufacturer: Advance Tabco
Model: 9-OP-28

Mop Sink, floor mounted, 33"W x 25"D x 10"H (overall), 28"W x 20" front-to-back x 6" deep (bowl size), free flow drain with 2" IPS outlet, stainless steel construction, NSF

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.70 MOP SINK FAUCET
Quantity: One (1)
Manufacturer: Advance Tabco
Model: K-240

Service Sink Faucet, wall mount, heavy duty, 8" OC, 6-1/2" spout, with hose thread & pail hook, vacuum breaker spout, wall braced, chrome-plated brass

Or Approved Comparable Product by one of the following Manufacturers:
Eagle Group, John Boos

ITEM # 2.71 CART, LAUNDRY
Quantity: Two (2)
Manufacturer: Rubbermaid Commercial Products
Model: 1881749

Two (2) Model 1881749 Executive Collapsible Basket X-Cart, 4 bushel capacity (up to 220 lb. capacity), 24-1/10"L x 20-3/10"W x 34"H, detachable black vinyl bag, stainless steel powder-coated frame, (4) swivel casters with bumper guards

ITEM # 2.72 SHELVING, UNIT
Quantity: One (1)
Manufacturer: Metro
Model: METROMAXQ

Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Four (4) Model MQ2148G Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Four (4) Model MX63UP Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Two (2) Model 5MPXGSA Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Two (2) Model 5MPBXGSA Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
Contractor to verify shelving size requirements with jobsite conditions

ITEM # 2.73 SHELVING, UNIT
Quantity: One (1)

EXISTING/TO BE RELOCATED

ITEM # 2.74 OPEN NUMBER

ITEM # 2.75 DOLLY, DISHWASHER RACK
Quantity: Seven (7)
Manufacturer: John Boos
Model: D2020-GT

Seven (7) Model D2020-GT Glass Rack Dolly, open frame design, single stack, for 20" x 20" racks, all aluminum welded construction, 3" swivel plate casters

ITEM # 2.76 POKER CHIP DOLLY
Quantity: Eight (8)
Manufacturer: Metro
Model: PCD11A

Eight (8) Model PCD11A Quick Ship - Poker Chip Dish Dolly, 26-5/8"W x 26-5/8"D x 31-15/16"H, adjustable, dish size 4-1/4" to 11-3/4", removable dividers & towers, two-handed access, recessed handles, 5"Dia. swivel casters with neoprene wheels (2 with brakes), chip-resistant polymer shell with Microban® antimicrobial protection, aesthetic blue, vinyl dust/water splash cover, NSF

ITEM # 3.01 REMOTE REFRIGERATION SYSTEM
Quantity: One (1)
Manufacturer: ThermalRite
Model: LCH0015MBACZA0000

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.06
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

Or Approved Comparable Product by one of the following Manufacturers:

ThermoKool, Bally

ITEM # 3.02 REMOTE REFRIGERATION SYSTEM
Quantity: One (1)
Manufacturer: ThermalRite
Model: LCH0060LCACZC2463

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.07
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

Or Approved Comparable Product by one of the following Manufacturers:
ThermoKool, Bally

END OF SECTION – 11 40 00 FOOD SERVICE EQUIPMENT

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SUNY CORTLAND RENOVATION

Cortland, NY

Foodservice Equipment Product Data Sheets

99% Bid Documents

09/18/2026

Submittal Sheet

09/15/2026

ITEM# 1.01 - WALK IN COOLER (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite CUSTOM

Pre-fabricated modular panel box of size and configuration shown in Contract Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 8’ 6”
Served by Items 1.02 and 1.08
Floor Construction: Manufacturer's floor, reinforced for heavy loads with diamond treadplate finish, installed per Detail W.4
Finish Interior and Exterior Walls and Ceiling: 26 ga Embossed Acrylume, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Quantity (1) 34” x 78” Flush Mounted Entrance Door
Door in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (1) set Vinyl Strip Curtain
Quantity (1) Extra vapor-proof LED light fixture
Quantity (1) Interior ramp with non-skid strips in finish to match walk-in floor

ACCESSORIES

Mfr	Qty	Model	Spec
PrepRite	1	SMARTRITE	For use with ThermalRite Walk-ins Refrigeration System Monitor and Controller mounted on front panel of walk-in beside the door Touch screen monitor features a TFT display with full color, hi-resolution graphics Where specified, controls walk-in lights, door and Vu-Port heaters Monitors walk-in temperature and relative humidity monitoring/logging for up to two compartments, with on-board data storage and auto roll-over Audio-visual alarms, with remote annunciation/notification capabilities Door open monitor/alarm High/low temperature alarm Panic/entrapment alarm Power failure alarm/monitoring Battery backup Real-time clock with auto daylight saving Bluetooth and WiFi capabilities with proprietary smartphone app Third-party BAS system compatibility

Description: Walk In Cooler (Cost incl in 2.05)

Notes: Pre-fabricated modular panel box of size and configuration shown in Contract Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 8’ 6”
Served by Items 1.02 and 1.08
Floor Construction: Manufacturer's floor, reinforced for heavy loads with diamond treadplate finish, installed per Detail W.4
Finish Interior and Exterior Walls and Ceiling: 26 ga Embossed Acrylume, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Quantity (1) 34” x 78” Flush Mounted Entrance Door
Door in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (1) set Vinyl Strip Curtain
Quantity (1) Extra vapor-proof LED light fixture
Quantity (1) Interior ramp with non-skid strips in finish to match walk-in floor

11 40 01-4

Submittal Sheet

09/15/2026

ITEM# 1.02 - EVAPORATOR COIL, +35F (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite LEL0095AS6AMAB0200

35 degree F operating temperature

Coupled with Item 1.08 for full refrigeration system

11 40 01-5

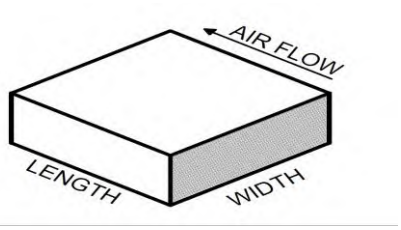
Refrigeration Specification

Quote #: E084352
Date: 09/30/2024

Item 1.01 - Cooler - Holding cooler

Room Temperature 35°F

Refrigeration system is designed to maintain 35°F at 80°F ambient temperature around box and 95°F outdoor ambient temperature assuming products enter at 35°F with moderate traffic.



28.25" 24.625"

Condensing Unit: LCH0010MBACZA0000

9700 BTUH

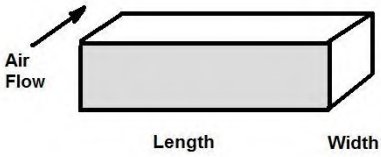
Ambient temp 95°F

Med Temp Air Cooled Scroll Condensing Unit with microchannel condenser, Liquid Line Filter/Drier and Sight Glass.

Compressor Type	Refrigerant	HP	Electrical	RLA	LRA	MCA	MOPD
Scroll	**R448/R449**	**1**	**208-230/1/60**	**7.30769**	**42**	**15**	**15**

Receiver Capacity	Liquid	Suction		Length	Width	Height	Weight
9	**0.375**	**0.625**		**28.25**	**24.625**	**19.75**	**179**

Notice:Air cooled condensing units require a minimum of 1000 cfm of fresh air per horsepower



Length Width

45.5" 13.25"

Unit Cooler: LEL0095AS6AMAB0200

QTY 1

10000 BTUH

Low profile coil (unit cooler) with EC fan motors, Electric Expansion Valve and iNtelliGen Controller.	**Heaters**		**Fans**	**Qty**	**2**
	Voltage	**N/A**	**Voltage**	**115/1/60**	
	Amps	**0**	**Amps Total**	**1.8**	

Drain Connection	Inlet	Suction	Equalizer	Length	Width	Height	Weight
3/4 MPT	**1/2 OD**	**5/8 OD**	**1/4 OD**	**45.5**	**13.25**	**16.44**	**51**

Standard Features:

Condensing Unit
Unit Cooler
Liquid Line Filter/Drier
Sight Glass
Pressure Control

Outdoor Systems Include:

Head Pressure Control
Weather Proof Housing
Crankcase Heater

11 40 01-6

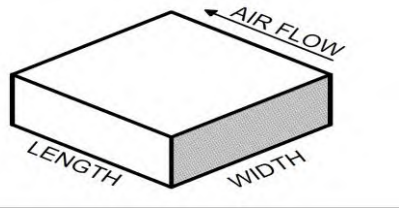
Refrigeration Specification

Quote #: E084352
Date: 09/30/2024

Item 2.05 - Combo Box - Holding freezer

Room Temperature -10°F

Refrigeration system is designed to maintain -10°F at 80°F ambient temperature around box and 95°F outdoor ambient temperature assuming products enter at -10°F with moderate traffic.



30.25" 43.875"

Condensing Unit: LCH0060LCACZC2463

19470 BTUH

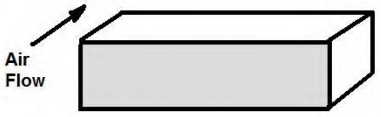
Ambient temp 95°F

Low Temp Air Cooled Scroll Condensing Unit with microchannel condenser, Liquid Line Filter/Drier and Sight Glass.

Compressor Type	Refrigerant	HP	Electrical	RLA	LRA	MCA	MOPD
Scroll	**R448/R449**	**6**	**208-230/3/60**	**21.4744**	**156**	**40.3**	**60**

Receiver Capacity	Liquid	Suction		Length	Width	Height	Weight
20	**0.5**	**0.875**		**30.25**	**43.875**	**29.25**	**327**

Notice:Air cooled condensing units require a minimum of 1000 cfm of fresh air per horsepower



Length 45.5" Width 13.25"

Unit Cooler: LEL0100BS6EEAB0200

QTY 2

19800 BTUH

Low profile coil (unit cooler) with EC fan motors, Electric Expansion Valve and iNtelliGen Controller.	**Heaters**		**Fans**	**Qty**	**2**
	Voltage	**208-230/1/60**	**Voltage**	**208-230/1/60**	
	Amps	**18.2**	**Amps Total**	**2**	

Drain Connection	Inlet	Suction	Equalizer	Length	Width	Height	Weight
3/4 MPT	**1/2 OD**	**7/8 OD**	**1/4 OD**	**45.5**	**13.25**	**16.44**	**59**

Standard Features:

Condensing Unit
Unit Cooler
Liquid Line Filter/Drier
Sight Glass
Pressure Control

Outdoor Systems Include:

Head Pressure Control
Weather Proof Housing
Crankcase Heater

11 40 01-7

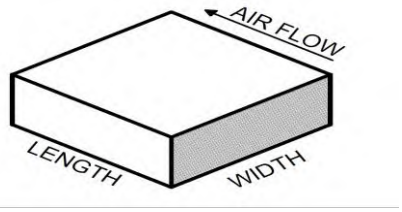
Refrigeration Specification

Quote #: E084352
Date: 09/30/2024

Item 2.05 - Combo Box - Holding cooler

Room Temperature 35°F

Refrigeration system is designed to maintain 35°F at 80°F ambient temperature around box and 95°F outdoor ambient temperature assuming products enter at 35°F with moderate traffic.



28.25" 39.125"

Condensing Unit: LCH0015MBACZA0000

13890 BTUH

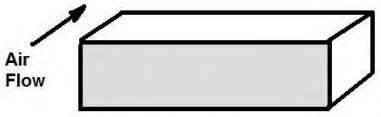
Ambient temp 95°F

Med Temp Air Cooled Scroll Condensing Unit with microchannel condenser, Liquid Line Filter/Drier and Sight Glass.

Compressor Type	Refrigerant	HP	Electrical	RLA	LRA	MCA	MOPD
Scroll	**R448/R449**	**1.5**	**208-230/1/60**	**10.2564**	**67**	**15**	**20**

Receiver Capacity	Liquid	Suction		Length	Width	Height	Weight
14	**0.5**	**0.875**		**28.25**	**39.125**	**19.75**	**221**

Notice:Air cooled condensing units require a minimum of 1000 cfm of fresh air per horsepower



Length Width

45.5" 13.25"

Unit Cooler: LEL0115AS6AMAB0200

QTY 1

14500 BTUH

Low profile coil (unit cooler) with EC fan motors, Electric Expansion Valve and iNtelliGen Controller.	**Heaters**		**Fans**	**Qty**	**2**
	Voltage	**N/A**	**Voltage**	**115/1/60**	
	Amps	**0**	**Amps Total**	**1.8**	

Drain Connection	Inlet	Suction	Equalizer	Length	Width	Height	Weight
3/4 MPT	**1/2 OD**	**7/8 OD**	**1/4 OD**	**45.5**	**13.25**	**16.44**	**56**

Standard Features:

Condensing Unit
Unit Cooler
Liquid Line Filter/Drier
Sight Glass
Pressure Control

Outdoor Systems Include:

Head Pressure Control
Weather Proof Housing
Crankcase Heater

11 40 01-8

Submittal Sheet

09/15/2026

ITEM# 1.03 - HIGH DENSITY SHELVING (1 EA REQ'D)

Metro TT-MAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each system to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
Metro	1	TTS13NA	Super Erecta®, MetroMax® Q™ Top-Track Track Set, 13 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF
Metro	1	MXTTE24	MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports & hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	3	MXTTM21C	MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	12	MQ2160G	MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	8	MQ2460G	Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Item # _____

Job _____

We put space to work.

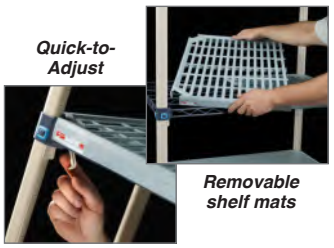
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Printed in U.S.A. 9/21

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Job _____

11.40.01.10

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



11 40 01-11

We put space to work.

Item # _____

Job _____

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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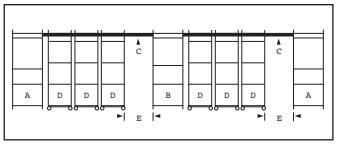
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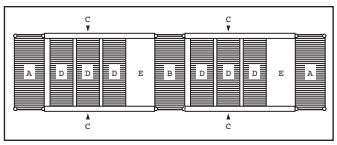
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
- **A** = Stationary End Units
- **B** = Stationary Intermediate Unit (Optional)
- **C** = Track Set
- **D** = Mobile Units
- **E** = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

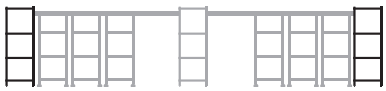
Mobile Unit Measurements
To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)
Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	mm	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

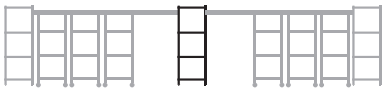


Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units
Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTE18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTE21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)
Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

11.40.01.13

MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

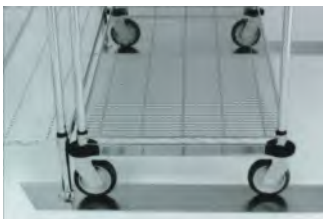
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

11 40 01-15

We put space to work.

Item # _____

Job _____

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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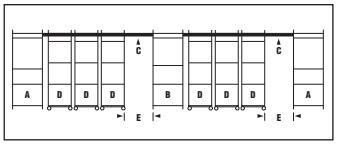
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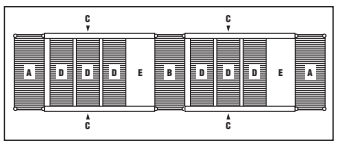
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Fits Shelf Width (in.)	mm	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

11.40.01.18

MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

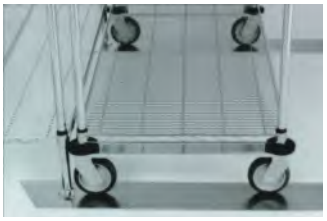
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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Item # _____

We put space to work.

Job _____

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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North Washington Street, Wilkes-Barre, PA 18705

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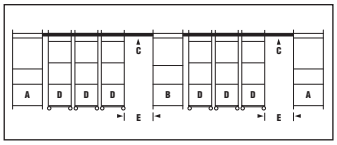
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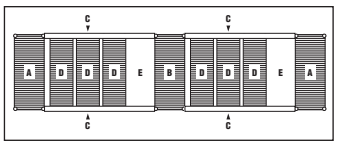
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Fits Shelf Width (in.)	mm	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	Model No.
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

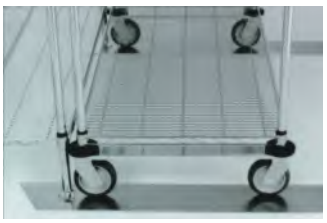
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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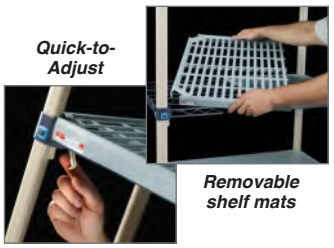
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2184mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



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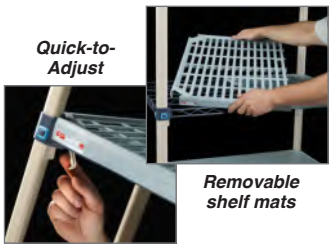
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



11 40 01-27

Submittal Sheet

09/15/2026

ITEM# 1.04 - HIGH DENSITY SHELVING (2 EA REQ'D)

Metro TT-MAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each system to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
Metro	2	TTS15NA	Super Erecta®, MetroMax® Q™ Top-Track Track Set, 15 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF
Metro	2	MXTTE24	MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports & hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	8	MXTTM21C	MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	32	MQ2160G	MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	16	MQ2460G	Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Item # _____

Job _____

We put space to work.

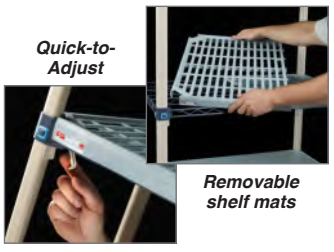
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

11.40.01.29

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



an Ali Group Company

GROUP

The Spirit of Excellence

11 40 01-30

We put space to work.

Item # _____

Job _____

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



NSF

- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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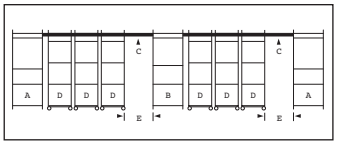
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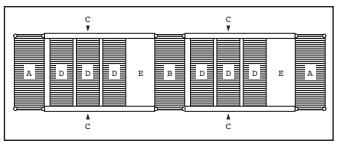
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
- **A** = Stationary End Units
- **B** = Stationary Intermediate Unit (Optional)
- **C** = Track Set
- **D** = Mobile Units
- **E** = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

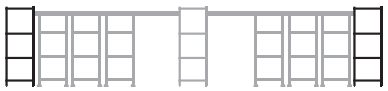
Mobile Unit Measurements
To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)
Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	mm	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

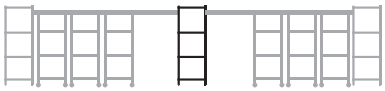


Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units
Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (640^{5}mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTE18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTE21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

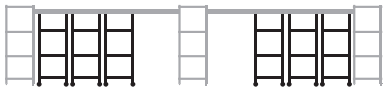


ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)
Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

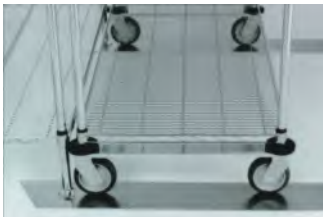
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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Item # _____

Job _____

We put space to work.

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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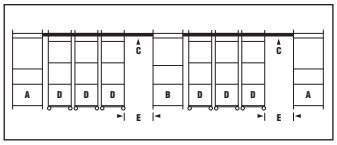
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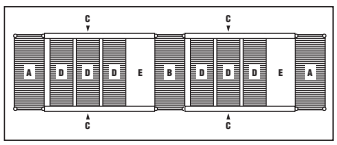
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	Model No.
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

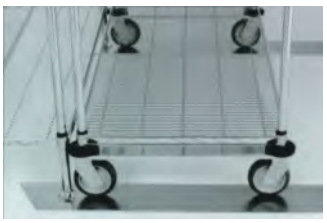
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

11 40 01-38

Item # _____

We put space to work.

Job _____

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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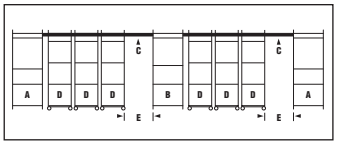
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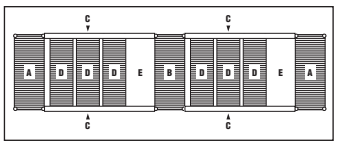
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Fits Shelf Width (in.)	mm	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	Model No.
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

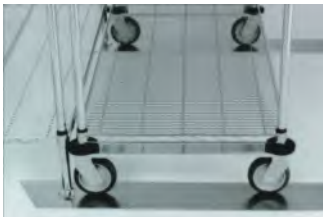
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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Item # _____

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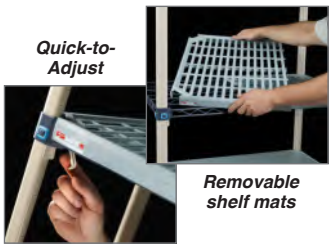
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2184mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

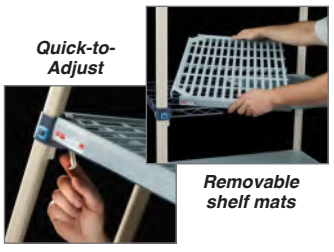
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Information and specifications are subject to change without notice. Please confirm at time of order.

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



Submittal Sheet

09/15/2026

ITEM# 1.05 - SHELVING, UNIT (12 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	4	MQ2142G	Quick Ship - MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	12	MQ2148G	Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	24	MQ2154G	MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	8	MQ2160G	MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	48	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	24	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	24	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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We put space to work.

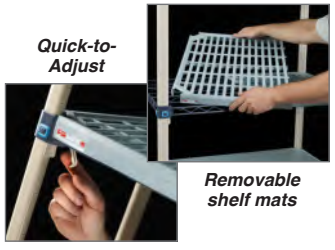
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
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MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



an Ali Group Company

GROUP

The Spirit of Excellence

11 40 01-49

Item # _____

Job _____

We put space to work.

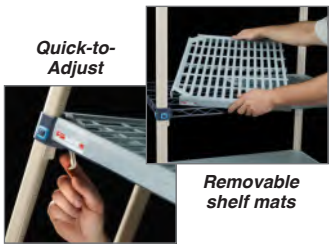
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
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  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Job _____

11.40.01.50

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2184mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

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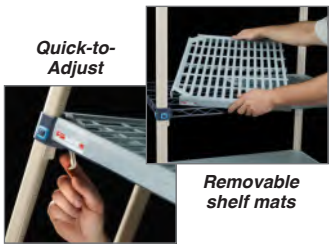
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

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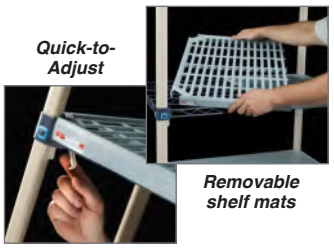
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

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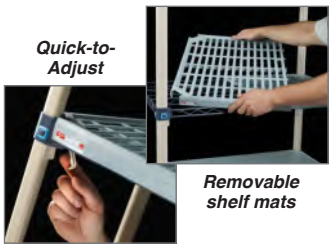
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

We put space to work.

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

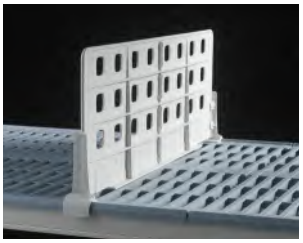
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

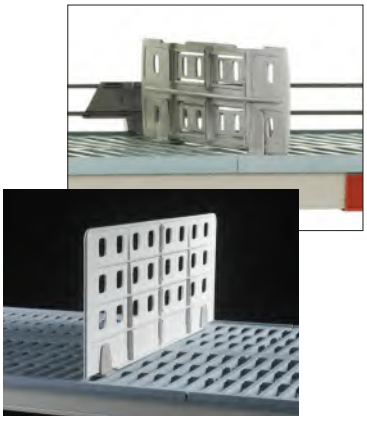
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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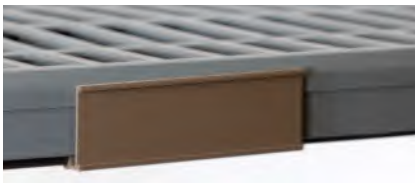
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.



i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152



MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp
Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate
Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp
Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

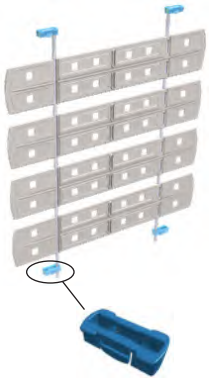
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



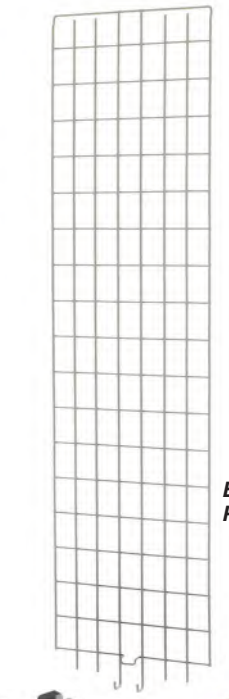
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



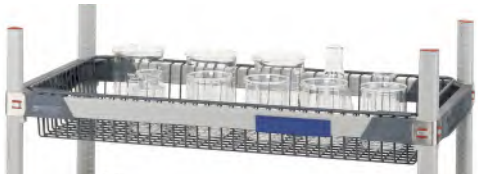
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

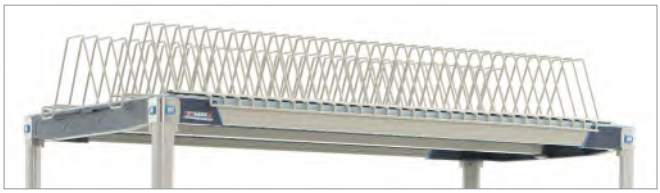
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7⅞ x 25⅝ x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1½" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

23141 SUNY Faye Corey Student Union

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

11.40.01.64

9.25

MetroMax® Accessories

We put space to work.

"S" Hooks

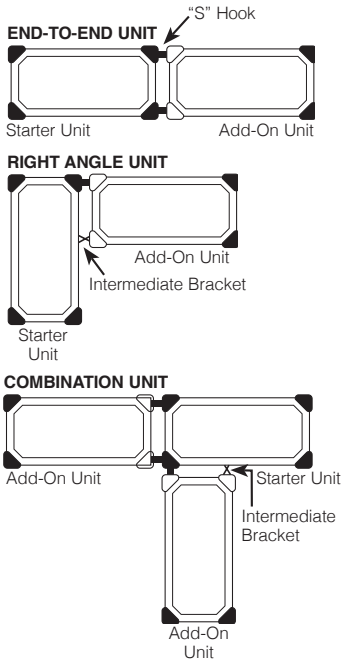
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

11 40 01-65

Submittal Sheet

09/15/2026

ITEM# 1.06 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-66

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-67

Submittal Sheet

09/15/2026

ITEM# 1.07 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-68

Description: OPEN NUMBER

Notes: OPEN NUMBER

Submittal Sheet

09/15/2026

ITEM# 1.08 - REMOTE REFRIGERATION SYSTEM (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite LCH0010MBACZA0000

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 1.01 and 1.02
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

ThermalRite LCH0010MBACZA0000 Item #1.08

11 40 01-70

Description: Remote Refrigeration System (Cost incl in 2.05)

Notes: Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 1.01 and 1.02
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

11 40 01-71

Submittal Sheet

09/15/2026

ITEM# 2.01 - REACH-IN REFRIGERATOR (1 EA REQ'D)

Continental Refrigerator D2RNSA

Designer Line Refrigerator, reach-in, two-section, self-contained refrigeration, stainless steel exterior, aluminum interior, stainless steel front, standard depth cabinet, full-height stainless steel doors, cylinder locks, electronic control with digital display, hi-low alarm, 6" stainless steel legs, R290 hydrocarbon refrigerant, 1/3 HP, cETLus, NSF, ENERGY STAR®

ACCESSORIES

Mfr	Qty	Model	Spec
Continental Refrigerator	1		cord, , standard
Continental Refrigerator	1		Left door hinged on left & right door hinged on right, standard
Continental Refrigerator	1	50205-4	Casters, swivel, with brakes (4" diameter rubber tires) set of 4 (5" height)

DESIGNER LINE REFRIGERATOR

11 40 01-72

Project Name:

Model Specified:

Location:

Item No: **Quantity:**

AIA #: **SIS #:**

Model: D2RN

Natural Refrigerant R-290 Model

Designer-line

2-Section Reach-In Refrigerator

ENERGY STAR® Qualified Commercial Refrigerator

D2RN - Stainless steel front, aluminum end panels and interior
D2RNSA - Stainless steel exterior, aluminum interior
D2RNSS - Stainless steel exterior and interior



Options and Accessories

(upcharge and lead times may apply)

Stainless steel case back	**Correctional Facility Options**
Additional epoxy coated steel shelves	• One way security screws
Chrome or stainless steel shelves	• Locking hasp (lock not included)
Wine rack	• Stainless steel mesh cover
Caster options	• Coverless hinges
Pan Slide Assemblies	Special electrical requirements (consult factory)
Custom laminates	Re-hinging of doors (consult factory)

Consult factory for other model configurations, options and accessories.

Standard Model Features

REFRIGERATION SYSTEM

- Self contained, performance rated "plug" refrigeration system
- Natural, environmentally safe, high efficiency R-290 refrigerant[1]
- Refrigeration system is readily accessible on top of cabinet, separate from the "food zone"
- Automatic, hot gas condensate evaporator
- Expansion valve system

CABINET ARCHITECTURE

- 3" non-CFC polyurethane foam insulation
- Smooth, polished chrome workflow door handles
- Cam action, lift off hinges
- Self-closing doors
- Magnetic snap-in Santoprene™ door gaskets
- Cylinder lock in each door
- Heavy duty pilaster strips
- Heavy duty, epoxy coated steel shelves
- Adjustable 6" stainless steel legs

MODEL FEATURES

- LED interior lighting
- Electronic control, off cycle defrost
- Top and side air distribution ducts
- Cabinet upper side panels and refrigeration "plug" system can be removed and reinstalled at job site

[1] R-290 refrigerant meets all federal and state regulatory requirements.

Continental® Refrigerator

WARRANTY 6 Year Parts & Labor 7 Year Compressor

APPROVAL:

Model Specifications

DIMENSIONAL DATA

Net Capacity (cubic feet)	50 (1416 cu l)
Width, Overall (inches)	52 (1321 mm)
Depth, Overall (inches) (including handles)	35 3/8 (899 mm)
Depth (inches) (less doors)	32 (813 mm)
Depth (inches) (doors open 90°)	55 1/2 (1410 mm)
Clear Door Width (inches)	19 3/8 (492 mm)
Clear Door Height (inches)	58 5/8 (1489 mm)
Height, Overall (inches) (including 6" legs)	83 1/4 (2115 mm)
Number of Doors	2
Number of Shelves	6
Shelf Area (square feet)	40.8 (3.8 sq m)
Tray Slide Capacity (per section) (2" centers)	24

REFRIGERANT DATA

Condensing Unit Size (H.P.)	1/3+
Capacity (BTU per hour)*	2560

ELECTRICAL DATA

Voltage (International)	115/60/1 (220/50/1)
Feed Wires (including ground)	3
Total Amps (International)	6.3 (4.3)
10 ft. Cord/Plug [attached] (International)	Yes (No)

SHIPPING DATA

Height - Crated (inches)	85 1/2 (2172 mm)
Width - Crated (inches)	64 (1626 mm)
Depth - Crated (inches)	42 (1067 mm)
Volume - Crated (cubic feet)	133 (3766 cu l)
Weight Std - Crated (pounds)	445 (202 kg)
Weight SS - Crated (pounds)	530 (241 kg)

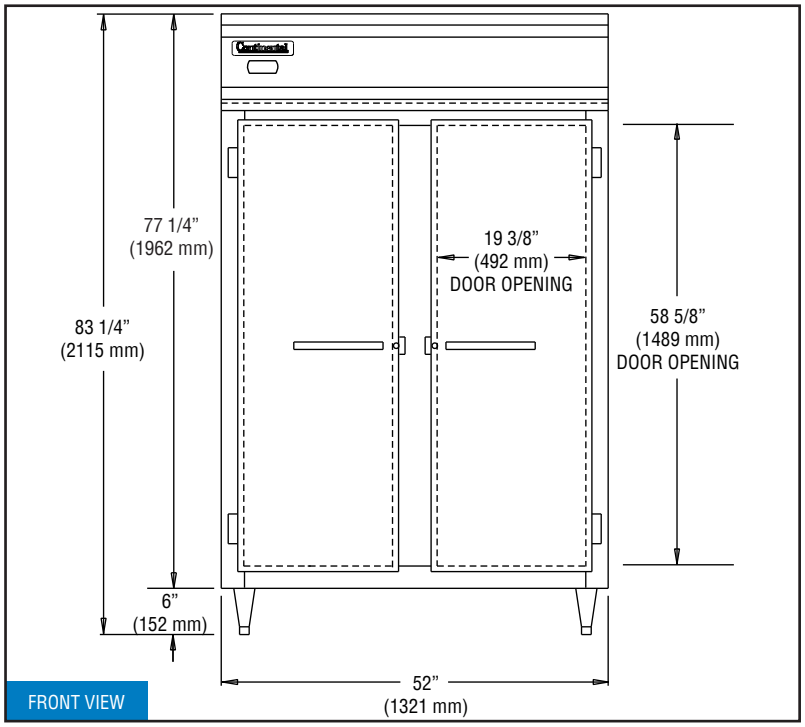
* Rating @ +25°F evaporator, 90°F ambient
Figures in parentheses reflect metric equivalents rounded to the nearest whole unit.

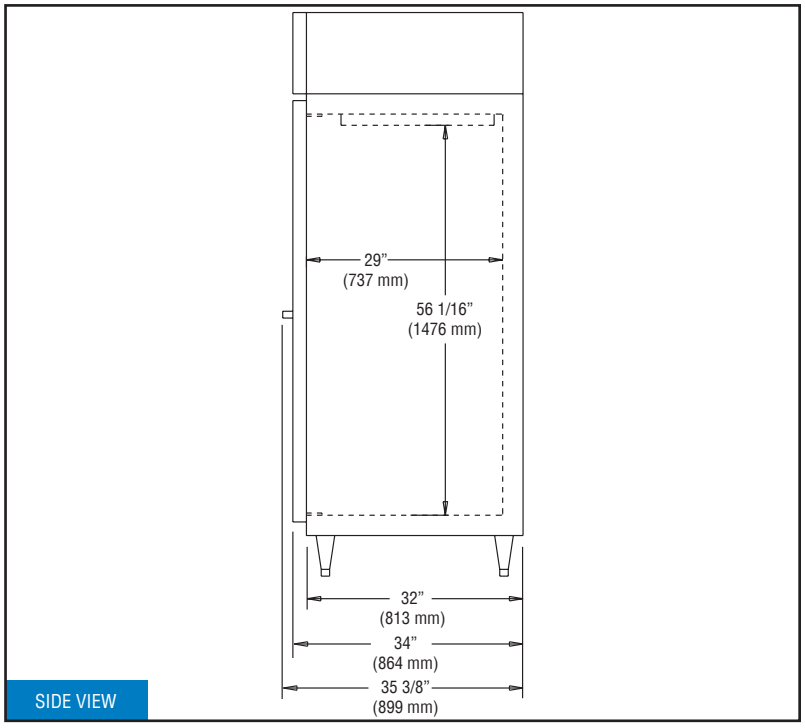


Equipped with one NEMA-5-15P Plug
(varies by country)

Model Plan Views

11 40 01-73





IMPORTANT NOTE: If the cabinet is located directly against a wall and/or under a low ceiling, a minimum clearance of 12" is required on top and 3" on sides and rear.

Continental Refrigerator

Toll-Free: 800-523-7138
Phone: 215-244-1400
Fax: 215-244-9579

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Bensalem, PA 19020
www.continentalrefrigerator.com

Due to our continued efforts in developing innovative products, specifications subject to change without notice.

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REVISED: 6/26/24

Submittal Sheet

09/15/2026

ITEM# 2.01A - REFRIGERATOR, REACH-IN (EXISTING/RELOCATED) (2 REQ'D)

Custom EXISTING / RELOCATED

EXISTING / RELOCATED

Description: REFRIGERATOR, REACH-IN (Existing/Relocated)

Notes: EXISTING / RELOCATED

11 40 01-76

Submittal Sheet

09/15/2026

ITEM# 2.02 - SHELVING, UNIT (5 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	12	MQ2154G	MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	8	MQ2160G	MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	20	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	10	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	10	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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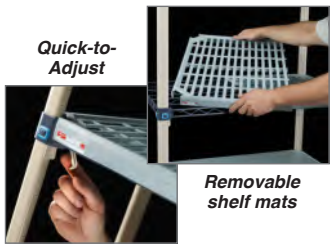
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2438mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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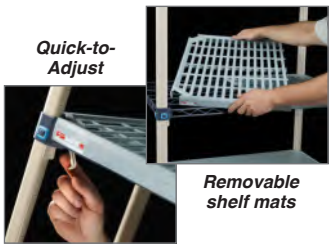
MetroMax Q® Polymer / Wire Shelving

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  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
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- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
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MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
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Mobile - for stem casters

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MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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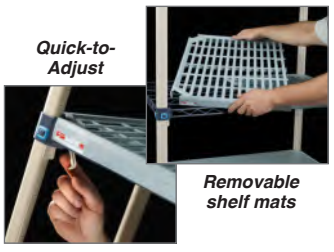
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- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
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- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

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Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

11.40.01-82

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



an Ali Group Company

GROUP

The Spirit of Excellence

11 40 01-83

Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

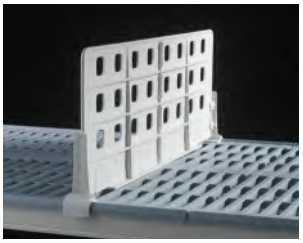
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

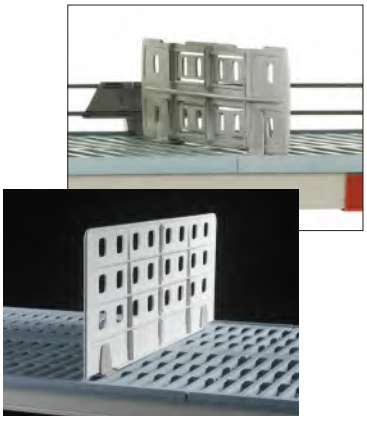
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

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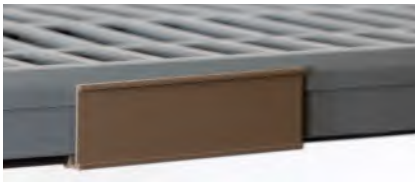
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.



i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152



MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp

Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate

Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp

Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

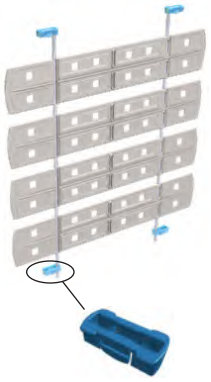
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



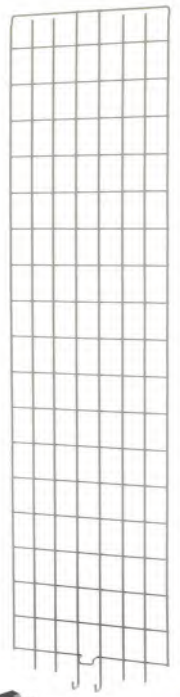
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



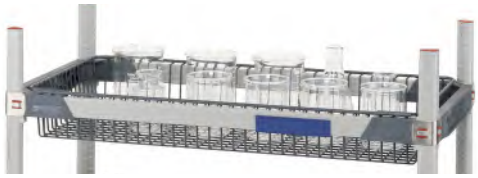
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

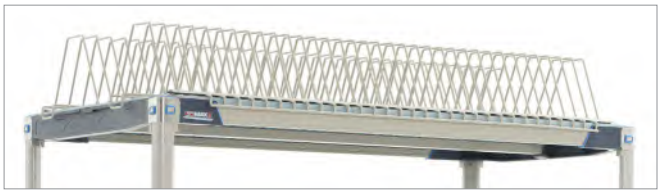
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

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MetroMax® Accessories

We put space to work.

"S" Hooks

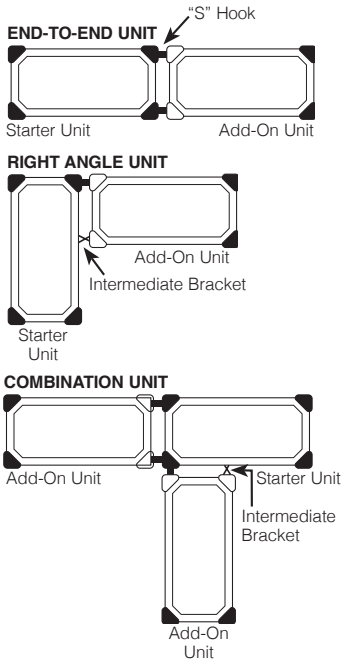
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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Submittal Sheet

09/15/2026

ITEM# 2.03 - SHELVING, UNIT (7 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	4	MQ2136G	MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	16	MQ2142G	MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	8	MQ2148G	MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	28	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	14	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	14	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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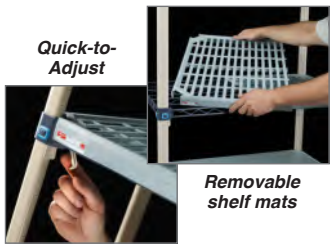
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2438mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

We put space to work.

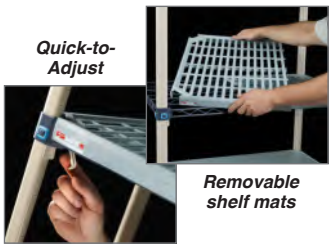
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





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  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

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We put space to work.

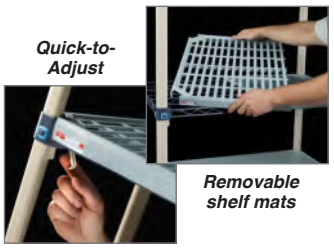
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

11.40.01-97

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

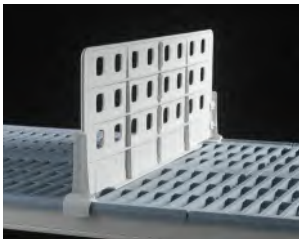
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

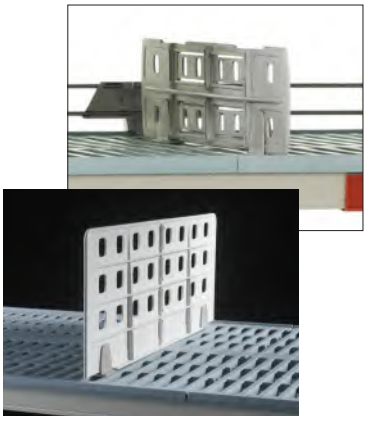
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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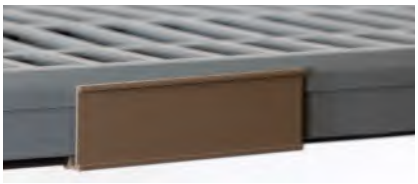
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.

i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152





MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp

Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate

Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp

Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories



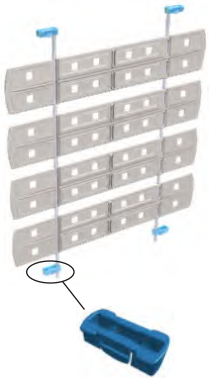
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610

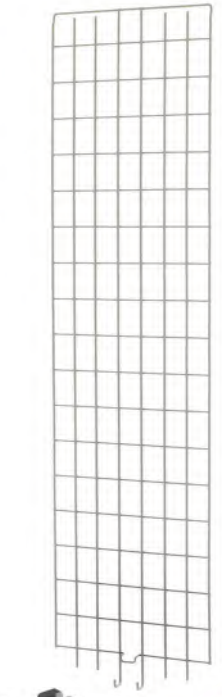


Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips

Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



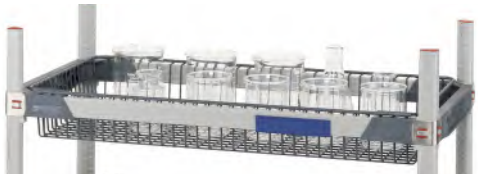
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

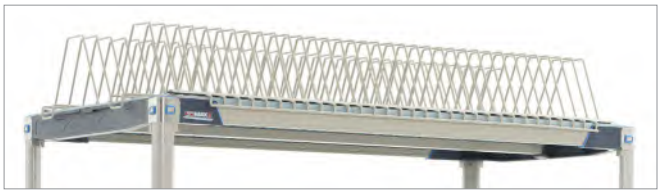
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

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MetroMax® Accessories

We put space to work.

"S" Hooks

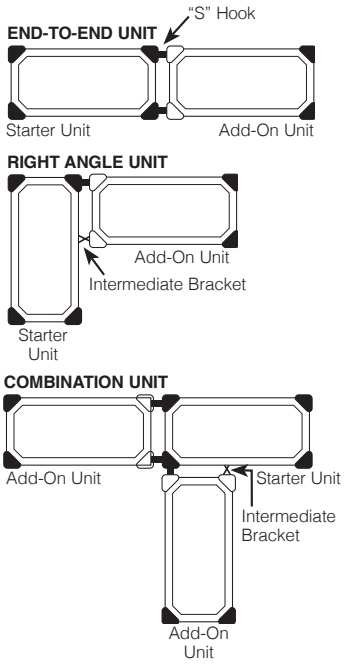
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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The Spirit of Excellence

11 40 01-106

Submittal Sheet

09/15/2026

ITEM# 2.04 - HIGH DENSITY SHELVING (1 EA REQ'D)

Metro TT-MAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each system to consist of two top tracks, two stationary kits, four mobile kits, with four tiers of shelves on each stationary and mobile kits.
Metro	1	TTS20NA	Super Erecta®, MetroMax® Q™ Top-Track Track Set, 20 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF Special length: 19'6"
Metro	1	MXTTE24	MetroMax Top-Track™ End Unit Kit, includes components for (2) 24"W stationary end units: (8) 86"H corrosion-proof polymer posts, track supports & hardware, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	6	MXTTM21C	MetroMax Top-Track™ Mobile Unit Kit, 21"W, includes: (4) MX74UP 74"H corrosion proof posts, (4) bumpers, (4) roller assemblies, (2) caster channels & (4) plate casters, compatible with MetroMax® 4™ & MetroMax® Q™ shelves (sold separately), NSF
Metro	24	MQ2160G	MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	8	MQ2460G	Quick Ship - MetroMax® Q Shelf, 60"W x 24"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Item # _____

Job _____

We put space to work.

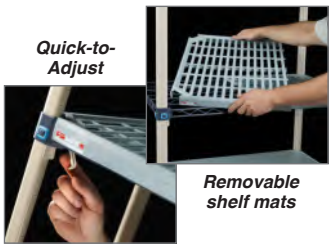
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

We put space to work.

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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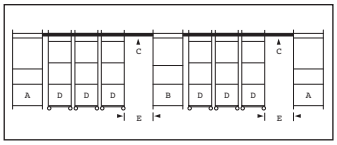
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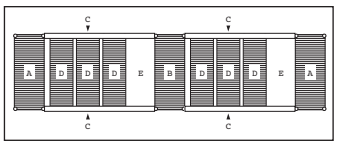
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

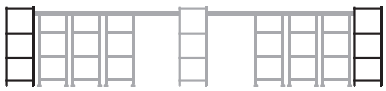
Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



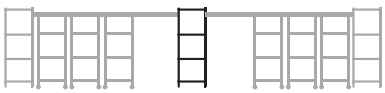
Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTE18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTE21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



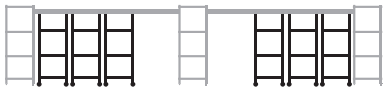
ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

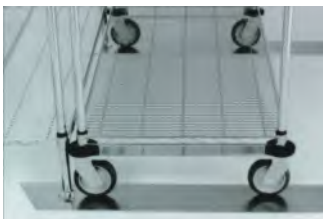
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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Item # _____

Job _____

We put space to work.

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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Information and specifications are subject to change without notice. Please confirm at time of order.

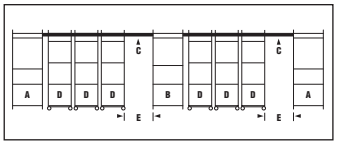
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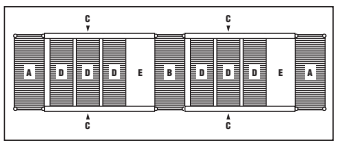
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
- **A** = Stationary End Units
- **B** = Stationary Intermediate Unit (Optional)
- **C** = Track Set
- **D** = Mobile Units
- **E** = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements
To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)
Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units
Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)
Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

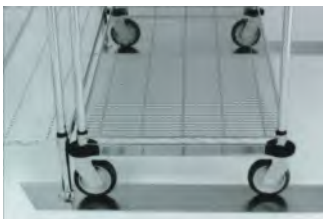
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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Item # _____

Job _____

We put space to work.

MetroMax® Top-Track® High-Density Storage

For MetroMax i, MetroMax 4 and MetroMax Q



- **Maximizes Storage Capacity:** Top-Track can increase the storage capacity of a given area up to 40%. The system allows more storage units to fit in a defined space. A movable, open aisle allows full access to each entire shelving unit thus eliminating hard to reach or "dead" spaces.
- **Easy Access:** The overhead track system guides the mobile units and opens an access aisle between any two units, whenever it is needed. The track is above the storage units enabling easy access for employees or for utility carts, simplifying the material handling task.
- **Cost-Saving Performance:** This efficient utilization of space addresses the storage needs of new or growing operations. In a new facility, less square footage would have to be dedicated to storage. In growing operations, MetroMax Top-Track can eliminate the need to expand the facility to handle increasing storage requirements, greatly reducing the costs associated with a growing business's needs.
- **Uniquely Interchangeable:** Corrosion resistant MetroMax Q steel posts can improve the overall rigidity of the Top-Track system in higher weight bearing applications. Polymer posts are offer rust-proof performance.
- **Clean Design:** Guide tracks are installed overhead enabling easy cleaning of floors. MetroMax shelves feature removable polymer mats. *Microban antimicrobial product protection is built into the high contact areas of the shelving systems — shelf mats, frames, and posts — to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the shelves and posts "cleaner between cleanings".
- **Increased Productivity:** With reduced square footage dedicated to storage, MetroMax Top-Track maximizes the amount of productive "front of the house" space available, increasing daily revenues.

  The system compensates for uneven floor surfaces. Floor should be smooth and free from large cracks or raised obstacles.

All MetroMax shelving styles are available for Top-Track configurations.

MetroMax i: (heavier duty polymer shelving with stainless corners) most commonly used with polymer posts. See spec sheet 9.20 for more information.

MetroMax 4: all-polymer shelving; most commonly used with polymer posts. See spec sheet 9.22 for more information.

MetroMax Q: (hybrid polymer and wire shelving) most commonly used with epoxy coated steel posts. See spec sheet 9.21 for more information.

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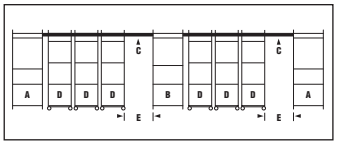
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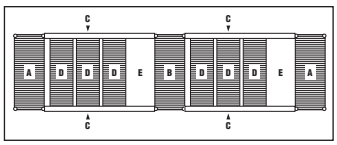
MetroMax® Top-Track® High-Density Storage

SYSTEM COMPONENTS
A = Stationary End Units
B = Stationary Intermediate Unit (Optional)
C = Track Set
D = Mobile Units
E = Open Aisle

FRONT VIEW



OVERHEAD VIEW



System Measurements

- Actual length: Nominal track length + the nominal width of each end unit + 2" (51mm)
- Actual width: Nominal Shelf length + 3-1/2" (89mm)
- Actual height of system is approximately 87" (2210mm)

It is recommended that the tracks are installed at least 5" (127mm) from the wall.

Mobile Unit Measurements

To accommodate bumpers, the actual size of a mobile unit is 2.5" (63.5 mm) wider than the shelf width shown. For example, an 18" (457 mm) wide unit is actually 20.5" (521 mm).

Choosing shelves: All end, intermediate, and mobile units must be 18" (457 mm) or wider. Choose from MetroMax i, MetroMax 4, or MetroMax Q options.

Stationary End Unit Kit (Choose one kit for each system)

Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting stationary end units to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	55.4	25.1	**MQTTE18**	31.0	15.7	**MXTTE18**
21	530	55.9	25.4	**MQTTE21**	31.5	15.9	**MXTTE21**
24	610	56.4	25.6	**MQTTE24**	32.0	16.1	**MXTTE24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



Traditional Configuration with stationary end units. ONE End Unit Kit is required per system. Shelves are ordered separately.

Stationary Intermediate Units

Required when overall desired track length exceeds 21' (6405mm). Optional when track length is under 21' (6405mm). Includes 86" high posts (2184mm) high stationary posts, and hardware necessary for connecting one stationary intermediate unit to tracks. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	MetroMax Q Steel Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.	MetroMax Polymer Posts: Approx. Pkd. Wt. (lbs.)	(kg).	Cat. No.
18	457	32.2	14.6	**MQTTA18**	21.8	9.9	**MXTTA18**
21	530	32.7	14.8	**MQTTA21**	22.3	10.1	**MXTTA21**
24	610	33.2	15.1	**MQTTA24**	22.8	10.3	**MXTTA24**

Note: All kits come with plated foot plates. Stainless Steel Foot plates must be ordered separately



ONE Intermediate Kit (see rules). Shelves are ordered separately.

Mobile Units (One kit required per mobile unit)

Includes four 74" (1880mm) high mobile posts, four casters, donut bumpers, guide rollers, and other hardware to assemble a mobile unit. Shelves are sold separately.

Fits Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Q Steel Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters	Approx. Pkd. Wt. (lbs.)	(kg).	MetroMax Polymer Posts: Cat. No. with Plated Casters	Cat. No. with Stainless Casters
18	457	32.2	14.4	MQTTM18C	MQTTM18S	21.8	10.2	MXTTM18C	MXTTM18S
21	530	32.7	14.5	MQTTM21C	MQTTM21S	22.3	10.3	MXTTM21C	MXTTM21S
24	610	33.2	14.6	MQTTM24C	MQTTM24S	22.8	10.4	MXTTM24C	MQTTM24S

Note: Casters have polyolefin treads.



ONE Mobile kit per mobile unit. Example: (6) needed in the above picture. Shelves are ordered separately.

Under normal conditions, aisle width of 30"-36" (760-914mm) is recommended. The storage of very large objects within the system, however, may require an aisle width larger than 36" (914mm).

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MetroMax® Top-Track® High-Density Storage

Track Sets
Includes tracks and hardware needed to assemble track runs up to 21' (6400mm).

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Super Erecta Brite Cat. No.
2.5	762	15.0	6.8	**TTS2.5NA**
6	1828	40.5	18.2	**TTS6NA**
7	2135	47.5	21.3	**TTS7NA**
8	2440	56.0	25.2	**TTS8NA**
9	2743	62.5	28.1	**TTS9NA**
10	3048	69.5	31.2	**TTS10NA**
11	3352	76.5	34.4	**TTS11NA**
12	3657	83.5	37.5	**TTS12NA**
13	3962	92.0	41.4	**TTS13NA**

Dimensions Length (ft.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)	Chrome Cat. No.
14	4267	98.0	44.1	**TTS14NA**
15	4572	106.5	47.9	**TTS15NA**
16	4877	113.5	51.0	**TTS16NA**
17	5182	121.0	54.4	**TTS17NA**
18	5486	128.0	58.0	**TTS18NA**
19	5791	135.0	60.7	**TTS19NA**
20	6096	142.0	63.9	**TTS20NA**
21	6400	149.0	67.0	**TTS21NA**

Note: Note: TTS2.5NA includes a joining kit to connect the tracks to other track sets.

For best performance on heavily loaded systems:

1. For configurations using shelves 60" (1524mm) or longer and managing heavier loads choose a more rigid shelving option. Wire shelving – Use all SES wire shelves. Polymer Shelving (MetroMax) – Epoxy coated steel posts offer the most rigid configuration.
2. Mobile Units: If 18" (457mm) wide mobile units are planned, the maximum allowable size shelf is 60" (1524mm) long. If 18" (457mm) wide by 60" (1524mm) long mobile units are planned, a maximum of five 18" (457mm) mobile units are allowable between two stationary units. 18" (457mm), 21" (530mm) and 24" (610mm) wide mobile units can be intermixed in a given system. The standard system requires 74" (1880mm) posts on the mobile units.
3. Weight capacities (evenly distributed) - Mobile Units. Super Erecta, Super Erecta Pro, Super Adjustable, MetroMax Q, MetroMax i: up to 900lbs. (408kg) MetroMax 4: up to 750lbs (340kg)
4. When using long tracks, 13ft or longer, securing the stationary units to the floor will help to keep the system in alignment.

Additional Configuration Notes

1. Standard Top-Track models include 86" (2185mm) stationary posts and 74" (1880mm) stem caster mobile posts. If a taller system or shorter systlem is required, consult Metro Engineering.
2. Existing Metro Super Erecta, Super Adjustable, Super Erecta Pro, MetroMax Q, MetroMax 4, and MetroMax i shelving units can be retrofitted as part of a Top-Track installation.

Installation Guidelines

1. It is recommended that the tracks are installed a minimum of 5" (127mm) from the wall.
2. It is the discretion of the user to install the end units to the floor.
3. Floor should be level, smooth, and free from cracks and raised objects.
4. For new construction, it is recommended that flooring of suitable durability is used in areas where Top-Track will be installed. When such flooring is not an option, floor pad protectors are recommended to protect soft flooring materials from wear and tear.
5. Enclosure panels may be used on mobile units. Panels must be mounted to ensure they do not interfere with the tracks. For standard MetroMax Top-Track Mobile Units with 74" (1890mm) posts, use the enclosures for the 63" (1585mm) posts.

Mobile Unit — Space Calculator . (Use to help determine the quantity of mobile units and the open aisle dimension)

	Nominal Shelf Depth	Actual Depth with Bumpers	Space Occupied by Each Quantity of Mobile Units: qty. 1	qty. 2	qty. 3	qty. 4	qty. 5	qty. 6	qty. 7	qty. 8	qty. 9	qty. 10	qty. 11
(in.)	18	20.5	20.5	41	61.5	82	102.5	123	143.5	64	184.5	205	225.5
(in.)	21	23.5	23.5	47	70.5	94	117.5	141	164.5	188	211.5	—	—
(in.)	24	26.5	26.5	53	79.5	106	132.5	159	185.5	212	—	—	—
(mm)	457	520.5	520.5	1041	1561.5	2082	2602.5	3123	3643.5	4164	4684.5	5205	5725.5
(mm)	530	593.5	593.5	1187	1780.5	2374	2967.5	3561	4154.5	4748	5341.5	—	—
(mm)	610	673.5	673.5	1347	2020.5	2694	3367.5	4041	4714.5	5388	—	—	—

Replacement Parts	**Model No.**
Rollers (bag of 4)*	**MAXROLL**
Bumpers for mobile units*	**M9992DBX**
Caster*	**5MOOR** (plated stem/horn); **5MOORSA** (stainless steel stem/horn)
Track joining kits	**HDWE-TTJOIN**
Hardware for track	**RPHDWE-TTECAP**
Footplates*	**9993Z** (zinc plated), **9993S** (Stainless Steel)

*Note: compatible with all MetroMax systems, past and present.

Job _____

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MetroMax® Top-Track® High-Density Storage

We put space to work.

Order Guide

1. Identify the available floor space
Evaluate Top-Track configurations to fill the space. The amount of space needed for the Top-Track unit is calculated by using this formula: Nominal track length + Nominal widths of each end unit + 2" (51mm).

2. Choose the shelving and desired posts.
Choose **(1) end unit kit** based on shelf depth.
Choose **(1) track set** to fill the space.
Select **shelves**.

3. Determine the desired open aisle space.
Reference the Mobile Unit — Space Calculator table on the previous page to select the depth and quantities of mobile units.

Select **mobile unit kits** (including finish for the casters). One needed per mobile unit.
Select **shelves**.

Example: (using MetroMax i)

1. 196" (4979mm) of floor space
12' track + 24" end + 24" end + 2" = 194"
3657mm + 610mm + 610mm +51mm = 4928mm

Top-Track system can be assembled to fill 194" (4928mm) length of floor space.

2.

End unit kit	**MXTTE24** (qty. 1)
Grid shelves	**MX2448G** (qty. 8)
Solid shelves	**MX2448F** (qty. 2)
Track Set	**TTS12NA** (qty. 1)

3. Desired open aisle is 36" (914mm).
Tracks measure 12' or 144" (3657mm).

Available space for mobile units is:
144" – 36" = 108" (3657 – 914 = 2743mm)

Each nominal 24" (610mm) unit measures 26.5" (673.5mm) when you include the bumpers.
(4) 26.5" (673.5mm) deep units = 106" (2440mm)

Mobile unit kit	**MXTTM24C** (qty. 4)
Grid shelves	**MX2448G** (qty. 12)
Solid shelves	**MX2448F** (qty. 4)

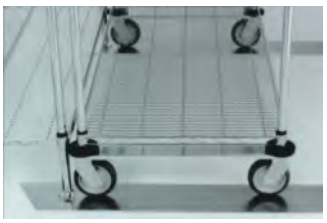
Top-Track Floor Pad Protectors

- Compensate for soft flooring materials by protecting the floor from normal wear and tear from mobile units.
- To make more applicable for sterile environments a bead of silicone (not included) is recommended to seal the seam between the floor pads and the floor.
- Material: aluminum

For Track Length (ft)	(mm)	Model No.	For Track Length (ft)	(mm)	Model No.
6	1828	**FPS6N**	14	4267	**FPS14N**
7	2135	**FPS7N**	15	4572	**FPS15N**
8	2440	**FPS8N**	16	4877	**FPS16N**
9	2743	**FPS9N**	17	5182	**FPS17N**
10	3048	**FPS10N**	18	5486	**FPS18N**
11	3353	**FPS11N**	19	5791	**FPS19N**
12	3657	**FPS12N**	20	6096	**FPS20N**
13	3962	**FPS13N**	21	6400	**FPS21N**



TTWM



Top-Track® Floor Protectors

Top-Track Wall Mount Bracket

Used to attach one set of tracks to the wall. Eliminates the need for a stationary end unit. Includes one pair of plated wall brackets. Hardware to attach the brackets to the wall is NOT included.
Model No. TTWM



TTSTP

Top-Track Stop Plate Kit

Used in conjunction with the Wall Mount Bracket kit. The aluminum stop plates bolt to the underside of the track next to the wall brackets to prevent mobile units from bumping into the wall.
Model No. TTSTP

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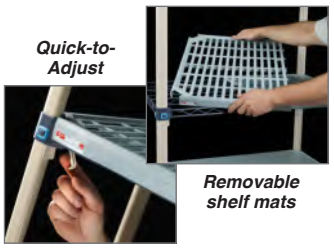
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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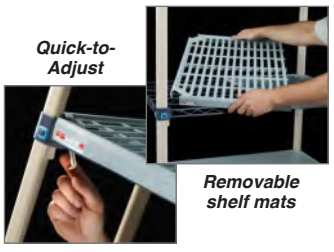
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2438mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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11 40 01-125

Submittal Sheet

09/15/2026

ITEM# 2.05 - WALK IN COOLER/FREEZER (1 EA REQ'D)

ThermalRite CUSTOM

Pre-fabricated modular panel box of size and configuration shown in Contract Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 9'0”
Served by Items 2.06, 2.07, 3.01 and 3.02
Floor Construction: Manufacturer's floor, reinforced for heavy loads with diamond treadplate finish, installed per Detail W.4
Finish Interior and Exterior Walls and Ceiling: 26 ga Embossed Acrylume, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Quantity (2) 34” x 78” Flush Mounted Entrance Doors
Doors in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (2) sets Vinyl Strip Curtain
Quantity (3) Extra vapor-proof LED light fixture
Quantity (1) Interior ramp with non-skid strips in finish to match walk-in floor

ACCESSORIES

Mfr	Qty	Model	Spec
PrepRite	1	SMARTRITE	For use with ThermalRite Walk-ins Refrigeration System Monitor and Controller mounted on front panel of walk-in beside the door Touch screen monitor features a TFT display with full color, hi-resolution graphics Where specified, controls walk-in lights, door and Vu-Port heaters Monitors walk-in temperature and relative humidity monitoring/logging for up to two compartments, with on-board data storage and auto roll-over Audio-visual alarms, with remote annunciation/notification capabilities Door open monitor/alarm High/low temperature alarm Panic/entrapment alarm Power failure alarm/monitoring Battery backup Real-time clock with auto daylight saving Bluetooth and WiFi capabilities with proprietary smartphone app Third-party BAS system compatibility

Description: Walk In Cooler/Freezer

Notes: Pre-fabricated modular panel box of size and configuration shown in Contract Documents, indoor installation, 4" thick urethane panels with interlocking cam-locks for tightly sealed installation, light fixtures shipped loose for field installation, NSF construction
Nominal height of box to be: 9'0”
Served by Items 2.06, 2.07, 3.01 and 3.02
Floor Construction: Manufacturer's floor, reinforced for heavy loads with diamond treadplate finish, installed per Detail W.4
Finish Interior and Exterior Walls and Ceiling: 26 ga Embossed Acrylume, provide matching metal trim strips & closure panels to adjacent walls & ceiling and matching metal base cove trim strips to adjacent floors, interior & exterior
Quantity (2) 34” x 78” Flush Mounted Entrance Doors
Doors in reinforced U-channel frame, provided with: Door heater wiring, pilot light & switch assembly, three spring-loaded door hinges, heavy-duty hydraulic door closers, vapor-proof LED light centered over door, 36” high aluminum diamond treadplate kickplate on each side of door, 2-1/2” dial thermometer, and break away cylinder lock hardware with inside safety release
Quantity (2) sets Vinyl Strip Curtain
Quantity (3) Extra vapor-proof LED light fixture
Quantity (1) Interior ramp with non-skid strips in finish to match walk-in floor

11 40 01-127

Submittal Sheet

09/15/2026

ITEM# 2.06 - EVAPORATOR COIL, +35F (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite LEL0115AS6AMAB0200

35 degree F operating temperature

Coupled with Item 3.01 for full refrigeration system

Description: EVAPORATOR COIL, +35F (Cost incl in 2.05)

Notes: 35 degree F operating temperature
Coupled with Item 3.01 for full refrigeration system

11 40 01-129

Submittal Sheet

09/15/2026

ITEM# 2.07 - EVAPORATOR COIL, -10F (COST INCL IN 2.05) (2 EA REQ'D)

ThermalRite LEL0100BS6EEAB0200

-10 degree F operating temperature

Coupled with Item 3.02 for full refrigeration system

Description: EVAPORATOR COIL, -10F (Cost incl in 2.05)

Notes: -10 degree F operating temperature
Coupled with Item 3.02 for full refrigeration system

11 40 01-131

Submittal Sheet

09/15/2026

ITEM# 2.08 - SHELVING, UNIT (4 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	4	MQ2136G	MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	12	MQ2160G	Quick Ship - MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	16	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	8	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	8	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Item # _____

Job _____

We put space to work.

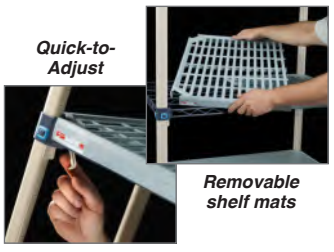
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Product Information. U.S. and Canada: 1.800.992.1776
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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2438mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

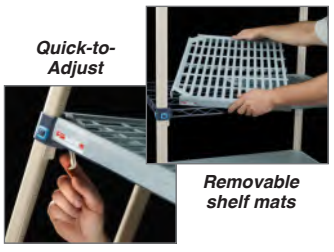
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



11 40 01-136

Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

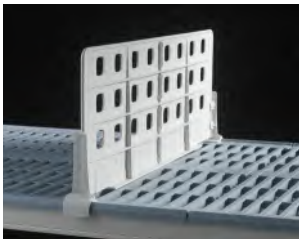
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

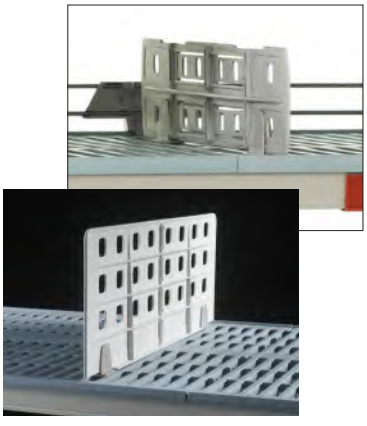
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Information and specifications are subject to change without notice. Please confirm at time of order.

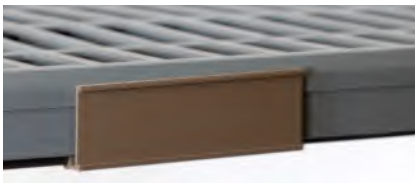
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.

i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152





MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp
Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate
Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp
Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories



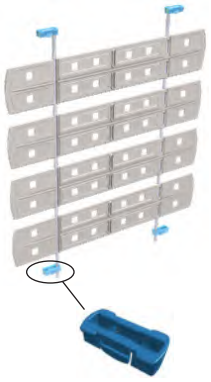
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610

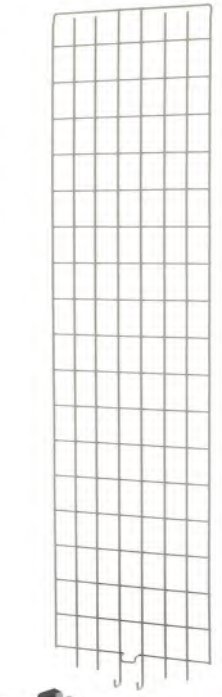


Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips

Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



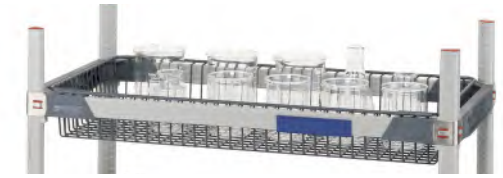
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

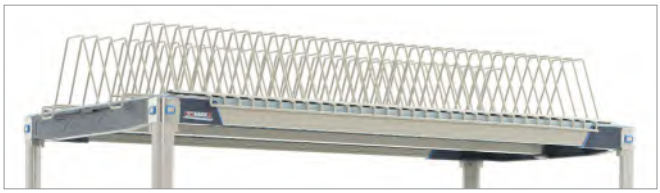
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

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MetroMax® Accessories

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"S" Hooks

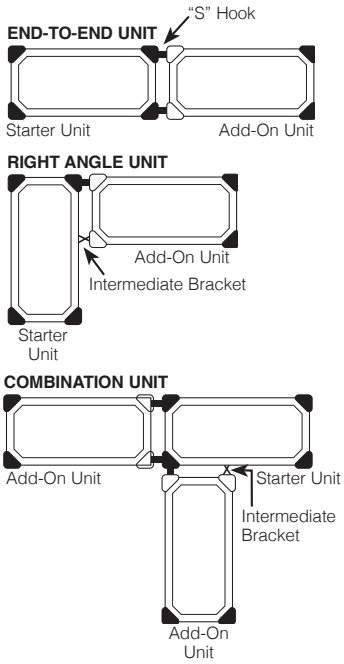
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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Submittal Sheet

09/15/2026

ITEM# 2.09 - SHELVING, UNIT (10 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	4	MQ2136G	MetroMax® Q Shelf, 36"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	4	MQ2142G	Quick Ship - MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	16	MQ2154G	Quick Ship - MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	16	MQ2160G	Quick Ship - MetroMax® Q Shelf, 60"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	40	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	20	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	20	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Job _____

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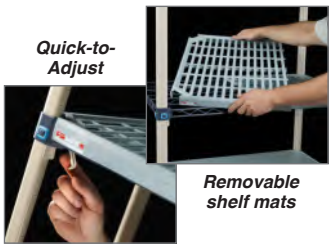
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

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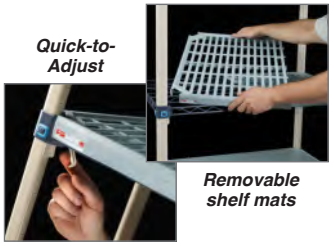
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



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We put space to work.

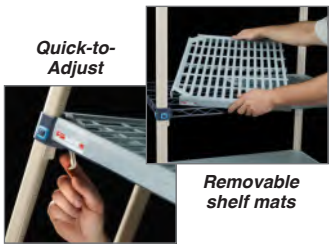
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



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Item # _____

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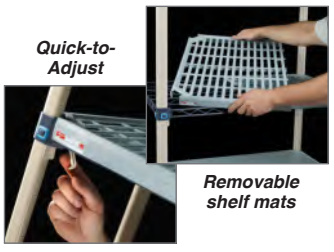
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



11 40 01-153

Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

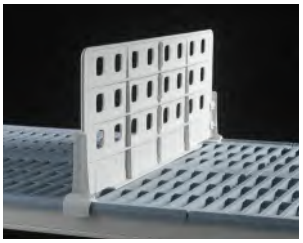
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

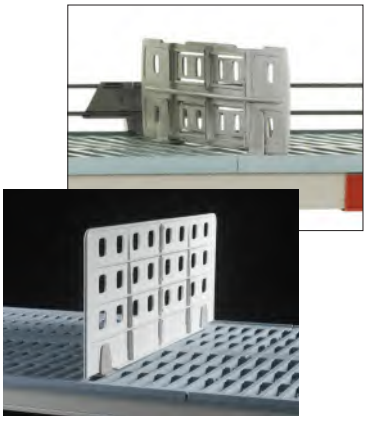
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Information and specifications are subject to change without notice. Please confirm at time of order.

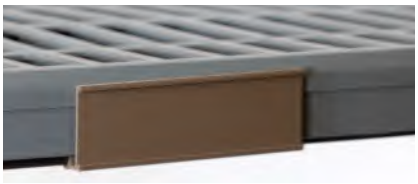
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.

i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152





MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp
Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate
Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp
Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

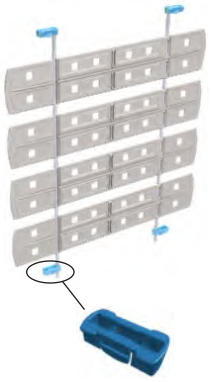
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



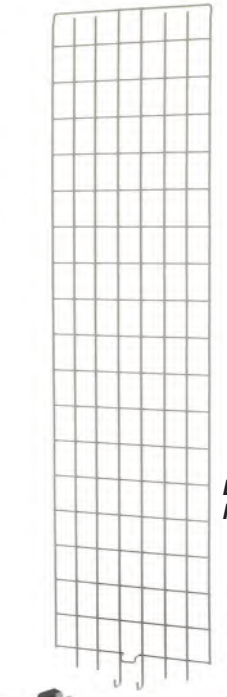
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



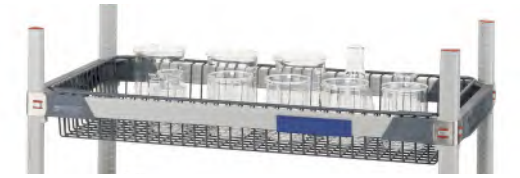
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

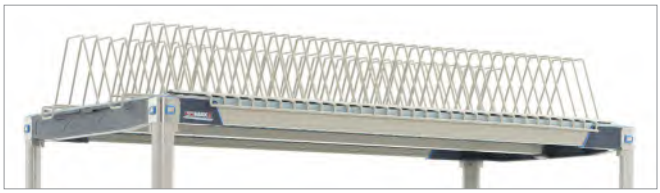
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

11 40 01-158

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

11.40.01.160

MetroMax® Accessories

We put space to work.

"S" Hooks

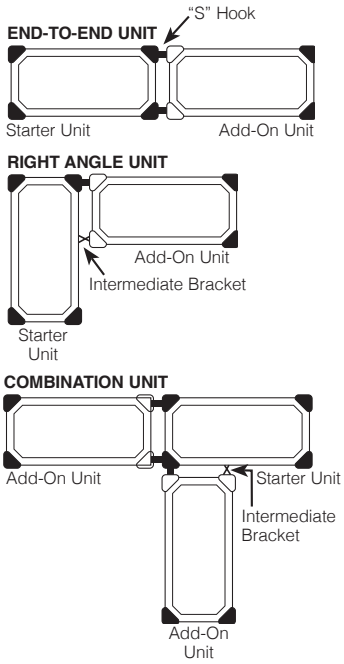
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

11 40 01-161

Submittal Sheet

09/15/2026

ITEM# 2.10 - HAND SINK (1 EA REQ'D)

Advance Tabco 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

HAND SINKS

with SOAP and PAPER TOWEL DISPENSER

Conforms To NSF 61/9 Lead Free Requirements

11 40 01-162

TOUCHLESS SOAP DISPENSER



7-PS-131



7-PS-79



7-PS-80

Includes Side supports



7-PS-69



7-PS-85

Includes Skirt

Item #: _____ **Qty #:** _____

Model #: _____

Project #: _____

FEATURES:
One piece **Deep Drawn** sink bowl design.
"Z" bracket wall mounting plate
Keyhole wall mount bracket.
C-fold style towel dispenser with hinged towel box.

Specific Unit Features:

7-PS-69:
10" x 14" x 5" sink bowl.
Splash mount liquid soap dispenser.
K-69 heavy duty splash mount faucet (with wrist handles)
Side support brackets.
Lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-79:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.

7-PS-80:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser
Includes lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-85
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Chrome plated 1 1/2" p-trap & apron.

7-PS-131:
10" x 14" x 5" sink bowl.
K-175 electronic faucet.
Splash mount touchless liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.
7-3/4" Side Splashes.

CONSTRUCTION:
All TIG welded.
All sink bowls have a large liberal radii with a minimum dimension of 2" and are rectangular in design.
Welded areas blended to match adjacent surfaces and to a satin finish.
Die formed countertop edge with a no-drip offset.

MATERIAL:
Heavy gauge type 304 series stainless steel.
Galvanized wall bracket.
All fittings are brass / chrome plated unless otherwise indicated.

MECHANICAL:
Faucet supply is 1/2" ips male thread hot and cold.

Faucet Flow Rate:
1.0 GPM/3.8 LPM aerator. 60 PSI.
7-PS-131 - 2.2 GPM/8.328 LPM aerator. 60 PSI.

FRONT LOAD TOWEL DISPENSER HAND SINKS

7-PS-41



A.D.A. Compliant

Electronic Faucet



7-PS-46

CLICK HERE TO VIEW SPEC SHEET

HANDS-FREE TOUCHLESS SOAP DISPENSER UPGRADE



7-PS-104

- Wall Mounted
- A/C or Battery Powered (Requires 4 "AA" Batteries. Not Included)
- Low Soap Indicator Window
- Includes Wall Bracket & Hardware
- Uses Liquid Soap

(Excludes 7-PS-131)

CLICK HERE TO VIEW SPEC SHEET

⚠ **WARNING:** Equipment that includes a faucet may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info., visit www.p65warnings.ca.gov.

ADVANCE TABCO
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

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Email: smartfab@advancetabco.com or Fax: 631-586-2933

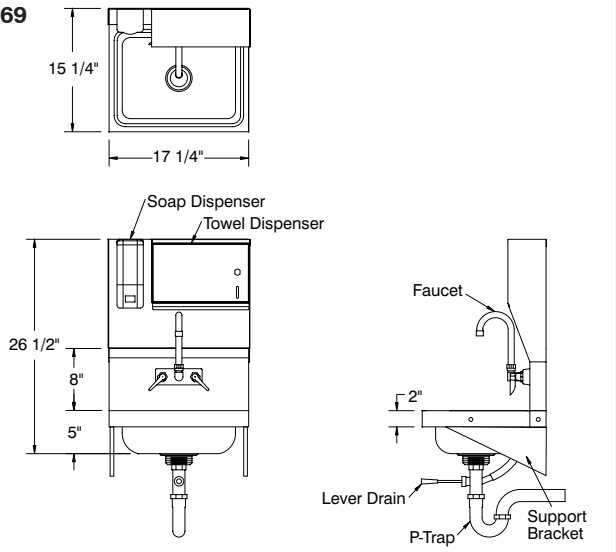
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DIMENSIONS and SPECIFICATIONS

11 40 01-163

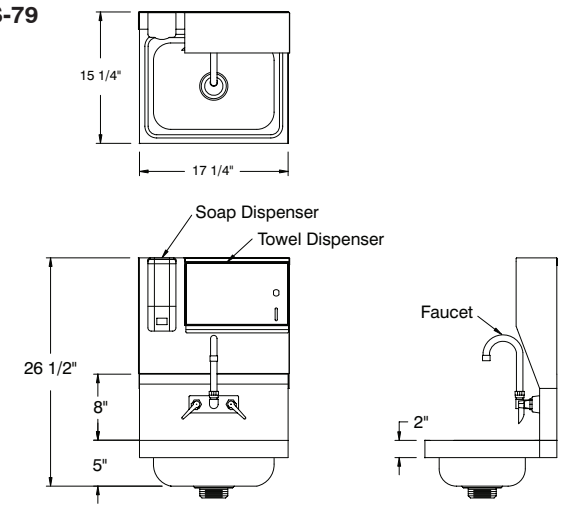
TOL Overall: ± .500" Interior: ± .250" **FITTINGS SUPPLIED AS SHOWN** **ALL DIMENSIONS ARE TYPICAL**

7-PS-69



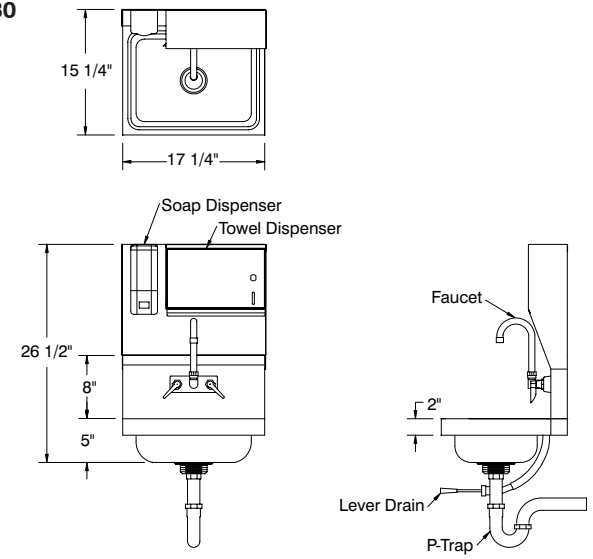
35 lbs.

7-PS-79



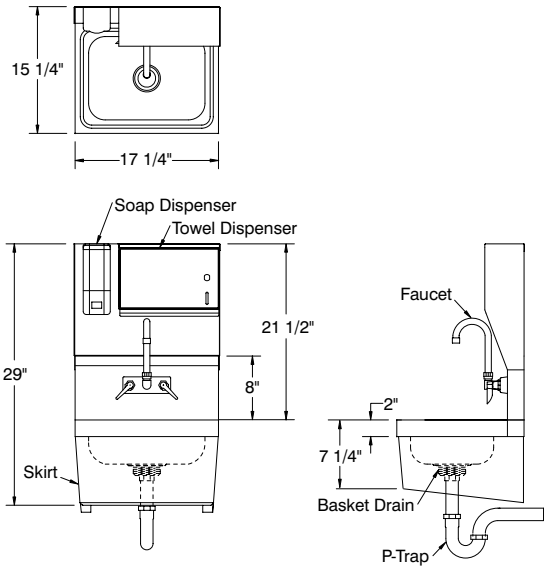
32 lbs.

7-PS-80



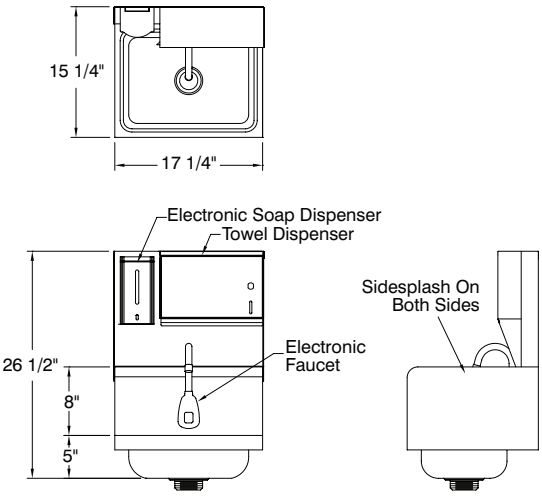
32 lbs.

7-PS-85



35 lbs.

7-PS-131



30 lbs.

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, FEBRUARY 2024

11 40 01-164



Submittal Sheet

09/15/2026

ITEM# 2.11 - FREEZER, REACH-IN (EXISTING/RELOCATED) (1 REQ'D)

Custom EXISTING / RELOCATED

EXISTING / RELOCATED

11 40 01-165

Description: FREEZER, REACH-IN (Existing/Relocated)

Notes: EXISTING / RELOCATED

Submittal Sheet

09/15/2026

ITEM# 2.12L - EXHAUST HOOD WITH MAKEUP AIR (1 EA REQ'D)

Halton KVE

100% 304 Stainless Steel Construction
Size of Hood: 162" x 69", with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.17, 2.18 and 2.19
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

Description: Exhaust Hood with Makeup Air

Notes: 100% 304 Stainless Steel Construction
Size of Hood: 162" x 69", with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.17, 2.18 and 2.19
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

Submittal Sheet

09/15/2026

ITEM# 2.12R - EXHAUST HOOD WITH MAKEUP AIR (COST INCL IN 2.12L) (1 EA REQ'D)

Halton KVE

100% 304 Stainless Steel Construction
Size of Hood: 162" x 69", with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.13, 2.15 and 2.16
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

Description: Exhaust Hood with Makeup Air (Cost Incl in 2.12L)

Notes: 100% 304 Stainless Steel Construction
Size of Hood: 162" x 69", with 24" wide ceiling makeup air plenum at front of hood
Number of hood sections: One
To serve equipment, Items: 2.13, 2.15 and 2.16
Integral piping for Fire Suppression System, Item 2.21
Light switch located on the hood
(5) Recessed LED light fixtures wired in conduit to common junction box located on top of hood
All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight.
Lighter material gauges, alternate material types and finishes are not acceptable.
18-gauge stainless steel removable enclosure panels from top of ventilator to underside of building ceiling (verify ceiling height in field), reinforce as required.
Provide detail on shop drawings and include adequate structural support behind enclosure panels to prevent oil canning and support panels
Mount at 7’-0” Above Finish Floor (AFF)
Manufacturer to comply with all state and local codes
Hanging brackets

11 40 01-170

Submittal Sheet

09/15/2026

ITEM# 2.13 - FRYER, GAS (1 EA REQ'D)

Pitco (Middleby) SG14RS-2FD

Solstice™ Prepackaged Fryer System with Solstice™ Filter Drawer System, High Power, gas, (2) 50 lb. oil capacity full tanks, millivolt control, stainless steel tank, front & sides, under-fryer drawer filtration, total 244,000 BTU (-FF), NSF, CE, CSA Flame, CSA Star, AuGA

ACCESSORIES

Mfr	Qty	Model	Spec
Pitco (Middleby)	1		Millivolt Thermostat, standard
Pitco (Middleby)	1	P6072145	Basket, (2) oblong/twin size, 13-1/2" x 6-1/2" x 5-3/4" deep, long handle, regular mesh (shipped std (n/c) with models "T" SG14, SG14R, SSH55, SE14, SE14X, SE14B, SG14T, 35+, 45+, fryer batteries shipped with (1) per fryer
Pitco (Middleby)	1	B3901504	Casters, 9" adjustable swivel non-lock rear & lock front casters, for battery of (2) Solstice gas and electric fryers, batteries and retherms
Pitco (Middleby)	1	B8003106	Gas Connector Hose, 1" connection, 48" long, with quick disconnect couplings, restraining device & thermal shut-off, for multiple units 390,000 BTU

11 40 01-171

Project _____

Item No. _____

Quantity _____

Filter Drawer (FD) and System Solstice Models

Model FD Solstice Filter Drawer



STANDARD ACCESSORIES

- Filter powder and fryer cleaner sample packets
- Filter paper envelope 18-1/2” x 20-1/2” (47 cm x 57 cm) sample packet - 25 sheets
- Cleaning brush
- Fryer scoop
- Filter scoop

STANDARD COMBINATIONS

Any combination of models SG14, SG14R, SG14T, SG18 and BNB are available. Refer to fryer specification sheets for options and other technical information. Additional filters may be needed for larger systems.

NOTE: Up to 6 models per filter. Standard filter location is on the left. Many other combinations are available. Call your dealer/distributor for more details.

OPTIONS & ACCESSORIES AT ADDITIONAL COST

- ☐ Flush hose
- ☐ Fryer brush
- ☐ Filter paper envelope 18-1/2” x 20-1/2” (47 cm x 57 cm); 100 sheets per package
- ☐ Paperless stainless steel mesh filter
- ☐ Filter heater for solid shortneing
- ☐ Filter scoop
- ☐ Filter powder

STANDARD SPECIFICATIONS

CONSTRUCTION

- Filter pan guide assembly are construction of polished stainless steel.
- Welded heavy-duty stainless steel filter pan mounted on two rigid casters for easy pan alignment and removal.
- 1/3 HP heavy duty motor and pump assembly.
- Large filter media area for filtering heavily breaded products.
- Special design pan stabilizer legs allow for ease of movement over rubber mats.

OPERATIONS

- Simple two-step operation:
  1. Blue handle valve is opened to drain oil into filter pan.
  2. Red handle valve is opened to return oil from filter to fryer.
- Self-aligning filter piping makes it easy to assemble and disassemble.
- Larger 3” (7.6 cm) drain line allows for faster draining without clogging.
- Light-weight, removable filter pickup assembly, with built-in handle, for fast media cleaning under busy conditions.
- High flow pump and large return lines produce faster oil refill times.
- Large filter media collects more debris, which extends time between changes.
- Filter pan lid attaches to cabinet for ease of use.
- Filter system can handle longer oil polishing duty cycles.
- All filter assembly parts are self-integrated. There are no loose parts to be misplaced.
- Large curved down spout drain virtually eliminates splashing and swivels for oil disposal.

APPROVALS

- CSA Certified (AGA, CGA)
- NSF Listed
- MEA Approved
- CE Certified
- Australian Gas Assoc. Certified (AuGA)

Patent Pending

The Australian Gas Association

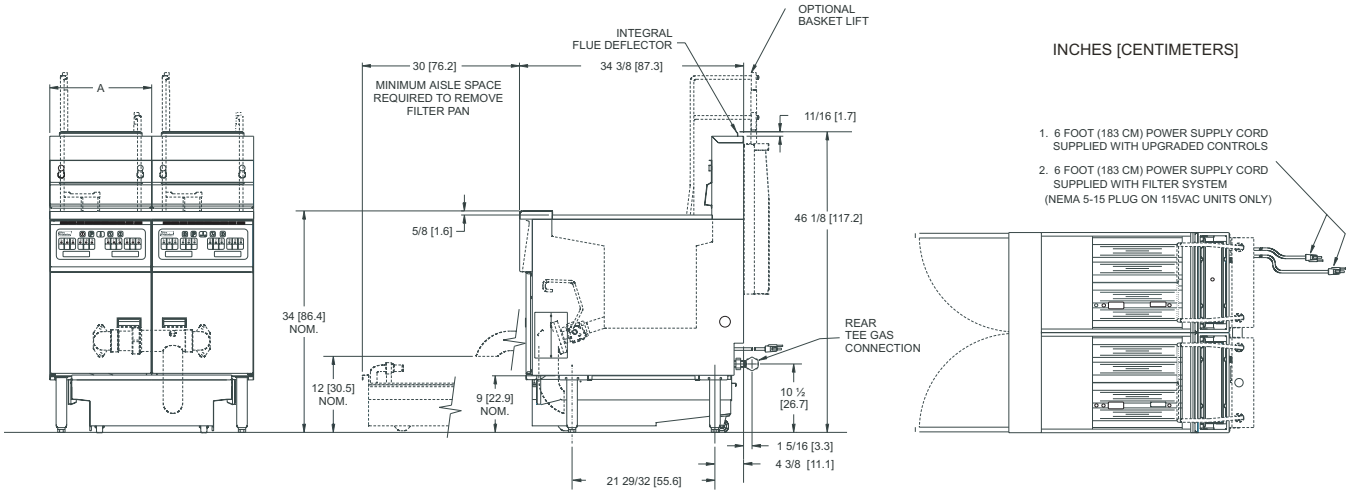
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(603) 225-6684 • Fax (603) 225-8472 • *www.pitco.com*

L10-134 Rev 4 (02/07)

Filter Drawer (FD) and System Solstice Models

11 40 01-172

Model FD Solstice Filter Drawer



GAS REQUIREMENTS

Gas Rear Tee Manifold	Maximum Number of Fryer Positions Per Manifold	Rear Tee Gas Connection Location	Gas Connection Size
SG14S, SG14RS, SG14TS, SG18S, SGBNB14, SGBNB18	4 fryer positions allowed; include BNB unit in position count.	Default location is to the left. Connection is field reversible to the right.	1-¼" NPT (1-¼" BSP CE AuGA) for 367 KBTU / 108 kW / 387 mJ to 560 KBTU / 164 kW / 591 mJ. 1 " NPT (1" BSP CE, AuGA) up to 366 kBTU / 107 kW / 386 mJ. ¾" NPT (¾" BSP CE, AuGA) for single units.
Gas Type	**Store Manifold Pressure***	**Burner Manifold Pressure**	***Recommended Minimum**
Natural Gas	7" W.C. / 17.4 mbars / 1.75 kPa	4" W.C. / 10 mbars / 1 kPa	Check plumbing/gas codes for proper gas supply line sizing.
L.P. Gas	13" W.C. / 32.4 mbars / 3.25 kPa	10" W.C. / 25 mbars / 2.5 kPa	
Clearance Information	**Fryer Front**	**Fryer Sides, Rear, Bottom to any combustible material**	**Fryer Flue Area**
All Models	30" (76.2 cm) minimum	6" (15.2 cm) Do not Curb Mount	Do not block or restrict the flue gasses from flowing into ventilation system.

ELECTRICAL REQUIREMENTS

Options		Voltage / Phase / Frequency	Amps	Additional Amps for Filter Heater	Number of Power Cords	Power Cord Locations
Filter	8.0 GPM (30.3 LPM) 1/3 HP	115 / 1 / 60	7	3	1	At filter location
	6.7 GPM (25.4 LPM) 1/3 HP	220-230-240 / 1 / 50	3.6	1.5		
Fryer	Millivolt controls	Not required	0	N/A	0	No power cord
	Upgrade controls: Solid state, Digital, Computer, Basket Lift	115 / 1 / 60	1.7	N/A	1 cord per 4 fryers	Default is left
		220-230-240 / 1 / 50	0.9	N/A		

GAS REQUIREMENTS

Models	"A" Dim	Cook Area	Oil Capacity	Gas Input / Hour	Shipping Weight / Unit	Shipping Cube	Shipping Dimensions H x W x L
SG14	15-5/8 in 39.7 cm	14 x 14 x 4 in 35.6 x 35.6 x 10.2 cm	40 - 50 lbs 18 – 23 kg	110,000 BTU 33 kW (CE) / 119 mJ (AuGA)	200 lbs 91 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
SG14R	15-5/8 in 39.7 cm	14 x 14 x 4 in 35.6 x 35.6 x 10.2 cm	40 - 50 lbs 18 – 23 kg	122,000 BTU 36 kW (CE) / 129 mJ (AuGA)	208 lbs 94 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
SG14T	15-5/8 in 39.7 cm	7 x 14 x 4 in/tank 17.8 x 35.6 x 10.2 cm/tank	20-25 lbs/tank 9-11.5 kg/tank	50,000 BTU/tank 15 kW (CE) / 50 mJ (AuGA)/ tank	230 lbs 104 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
SG18	19-5/8 in 49.8 cm	18 x 18 x 4 ~ 4 ¾ in 45.7 x 45.7 x 10.2 ~12.1 cm	70-90 lbs 32–41 kg	140,000 BTU 40 kW (CE) / 145 mJ ((AuGA)	226 lbs 103 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
SGBNB14	15-5/8 in 39.7 cm	14 ½ x 24 ½ x 4-5/8 in 36.8 x 62.2 x 11.9 cm	N/A	N/A	130 lbs 59 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
SGBNB18	19-5/8 in 49.8 cm	18 ½ x 24 ½ x 4-5/8 in 47 x 62.2 x 11.9 cm	N/A	N/A	150 lbs 68 kg	33 ft.³ .93 m³	58 x 22 ½ x 43 ½ in 147.3 x 57.2 x 110.5 cm
Filter	N/A	N/A	95 lbs 43 kg	N/A	125 lbs / 57 kg Add 20 lbs (9 kg) per fryer position	N/A Ships with fryer	N/A

SHORT FORM SPECIFICATION

Provide Pitco FD (Filter Drawer) Solstice filter system. Drain line shall be 3" (7.6 cm) diameter with a swivel drain spout for oil disposal. Filter pickup assembly shall have handles and utilize envelope type filter paper with 500 sq. inches (3,226 sq. cm) of filter area. Filter pump shall pump 8 GPM, 60 Hz (25.4 LPM, 50 Hz). Filter piping to be self-aligning for easy assembly. Filter lid shall be attached to the cabinet for ease of use. Filter pan shall have front stabilizer legs and rear rigid casters for portability. Provide accessories as follows:

TYPICAL APPLICATIONS

Space saving filter capable of filtering heavy to light breaded products fast and conveniently.

Pitco Frialator, Inc., P.O. Box 501, Concord, NH 03302-0501 • 509 Route 3A, Bow NH 03304, USA
(603) 225-6684 • Fax (603) 225-8472 • *www.pitco.com* *L10-134 Rev 4 (02/07)* *Printed in the USA*

We reserve the right to change specifications without notice and without incurring any obligation for equipment previously or subsequently sold.

11 40 01-173

Submittal Sheet

09/15/2026

ITEM# 2.14 - WORK TABLE, STAINLESS STEEL TOP (1 EA REQ'D)

Advance Tabco KSS-363

Work Table, 24"W x 36"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	3	TA-87	Enclose back of splash (per linear foot)
Advance Tabco	1	TA-25	Casters, 5", swivel, with rubber wheels (set of 4) (2 with brakes)
Advance Tabco	1	TA-25C	X.H.D. Urethane Wheel Upgrade, for TAor TA25 casters (per caster)

ADVANCE TABCO
SMA

STAINLESS STEEL

11 40 01-174

WORK TABLES

PREMIUM Series - 5" Backsplash - Undershelf Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Splash on Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with a 1 5/8" sanitary rolled rim edge on front, 1 5/8" square side edges, and a 5" splash with a 1" return on the rear side.

24" wide tables supplied with TWO hat channels stud welded to reinforce and maintain a level working surface. 30" and 36" wide tables supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts and bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

KSS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel.
1" adjustable stainless steel bullet feet.
Stainless steel gussets.

KLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel.
1" adjustable plastic bullet feet.
Galvanized steel gussets.

KSS-Series: Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KSS-240	KSS-300	
24"	KSS-242	KSS-302	KSS-362
36"	KSS-243	KSS-303	KSS-363
48"	KSS-244	KSS-304	KSS-364
60"	KSS-245	KSS-305	KSS-365
72"	KSS-246	KSS-306	KSS-366
84"	KSS-247	KSS-307	KSS-367
*96"	KSS-248	KSS-308	KSS-368
*108"	KSS-249	KSS-309	KSS-369
*120"	KSS-2410	KSS-3010	KSS-3610
*132"	KSS-2411	KSS-3011	KSS-3611
*144"	KSS-2412	KSS-3012	KSS-3612

NSF

KLG-Series: Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KLG-240	KLG-300	
24"	KLG-242	KLG-302	KLG-362
36"	KLG-243	KLG-303	KLG-363
48"	KLG-244	KLG-304	KLG-364
60"	KLG-245	KLG-305	KLG-365
72"	KLG-246	KLG-306	KLG-366
84"	KLG-247	KLG-307	KLG-367
*96"	KLG-248	KLG-308	KLG-368
*108"	KLG-249	KLG-309	KLG-369
*120"	KLG-2410	KLG-3010	KLG-3610
*132"	KLG-2411	KLG-3011	KLG-3611
*144"	KLG-2412	KLG-3012	KLG-3612

*Units 8 ft. and larger are furnished with six (6) legs

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

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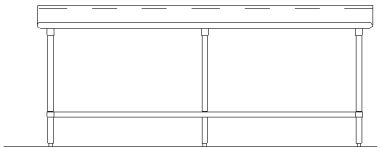
DETAILS and SPECIFICATIONS 11 40 01-175

ALL DIMENSIONS ARE TYPICAL TOL ± .500”

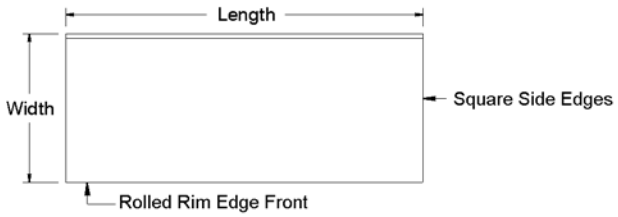
All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

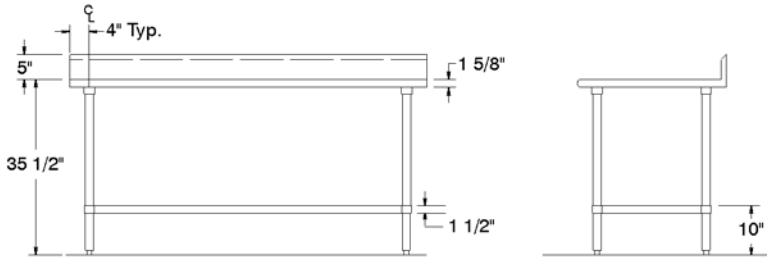
KSS & KLG Series
Undershelf Style
5” Backsplash

Finished size of undershelf = Length minus 5 3/4”
Width minus 5 3/4”



Units 8ft. and larger are furnished with six (6) legs





KSS-Series: Stainless Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	KSS-240	55 lbs.	KSS-300	70 lbs.		
24”	KSS-242	50 lbs.	KSS-302	56 lbs.	KSS-362	86 lbs.
36”	KSS-243	66 lbs.	KSS-303	77 lbs.	KSS-363	92 lbs.
48”	KSS-244	81 lbs.	KSS-304	92 lbs.	KSS-364	101 lbs.
60”	KSS-245	95 lbs.	KSS-305	111 lbs.	KSS-365	121 lbs.
72”	KSS-246	113 lbs.	KSS-306	129 lbs.	KSS-366	142 lbs.
84”	KSS-247	135 lbs.	KSS-307	153 lbs.	KSS-367	169 lbs.
96”	KSS-248	150 lbs.	KSS-308	171 lbs.	KSS-368	189 lbs.
108”	KSS-249	165 lbs.	KSS-309	195 lbs.	KSS-369	260 lbs.
120”	KSS-2410	268 lbs.	KSS-3010	294 lbs.	KSS-3610	315 lbs.
132”	KSS-2411	301 lbs.	KSS-3011	331 lbs.	KSS-3611	358 lbs.
144”	KSS-2412	316 lbs.	KSS-3012	346 lbs.	KSS-3612	373 lbs.

KLG-Series: Galvanized Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	KLG-240	55 lbs.	KLG-300	70 lbs.		
24”	KLG-242	50 lbs.	KLG-302	56 lbs.	KLG-362	86 lbs.
36”	KLG-243	66 lbs.	KLG-303	77 lbs.	KLG-363	92 lbs.
48”	KLG-244	81 lbs.	KLG-304	92 lbs.	KLG-364	101 lbs.
60”	KLG-245	95 lbs.	KLG-305	111 lbs.	KLG-365	121 lbs.
72”	KLG-246	113 lbs.	KLG-306	129 lbs.	KLG-366	142 lbs.
84”	KLG-247	135 lbs.	KLG-307	153 lbs.	KLG-367	169 lbs.
96”	KLG-248	150 lbs.	KLG-308	171 lbs.	KLG-368	189 lbs.
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120”	KLG-2410	268 lbs.	KLG-3010	294 lbs.	KLG-3610	315 lbs.
132”	KLG-2411	301 lbs.	KLG-3011	331 lbs.	KLG-3611	358 lbs.
144”	KLG-2412	316 lbs.	KLG-3012	346 lbs.	KLG-3612	373 lbs.

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TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



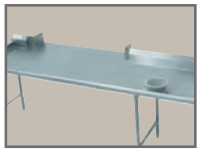
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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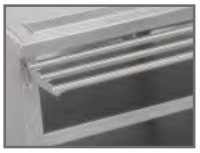
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TABLE MODIFICATIONS & ACCESSORIES

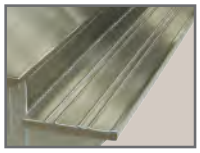
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



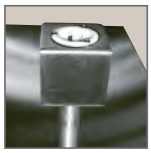
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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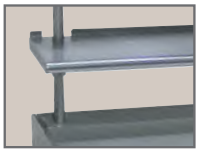
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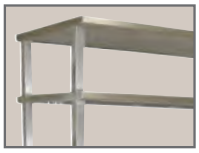
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



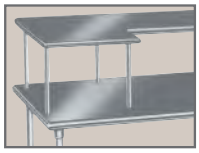
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs
TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs
TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

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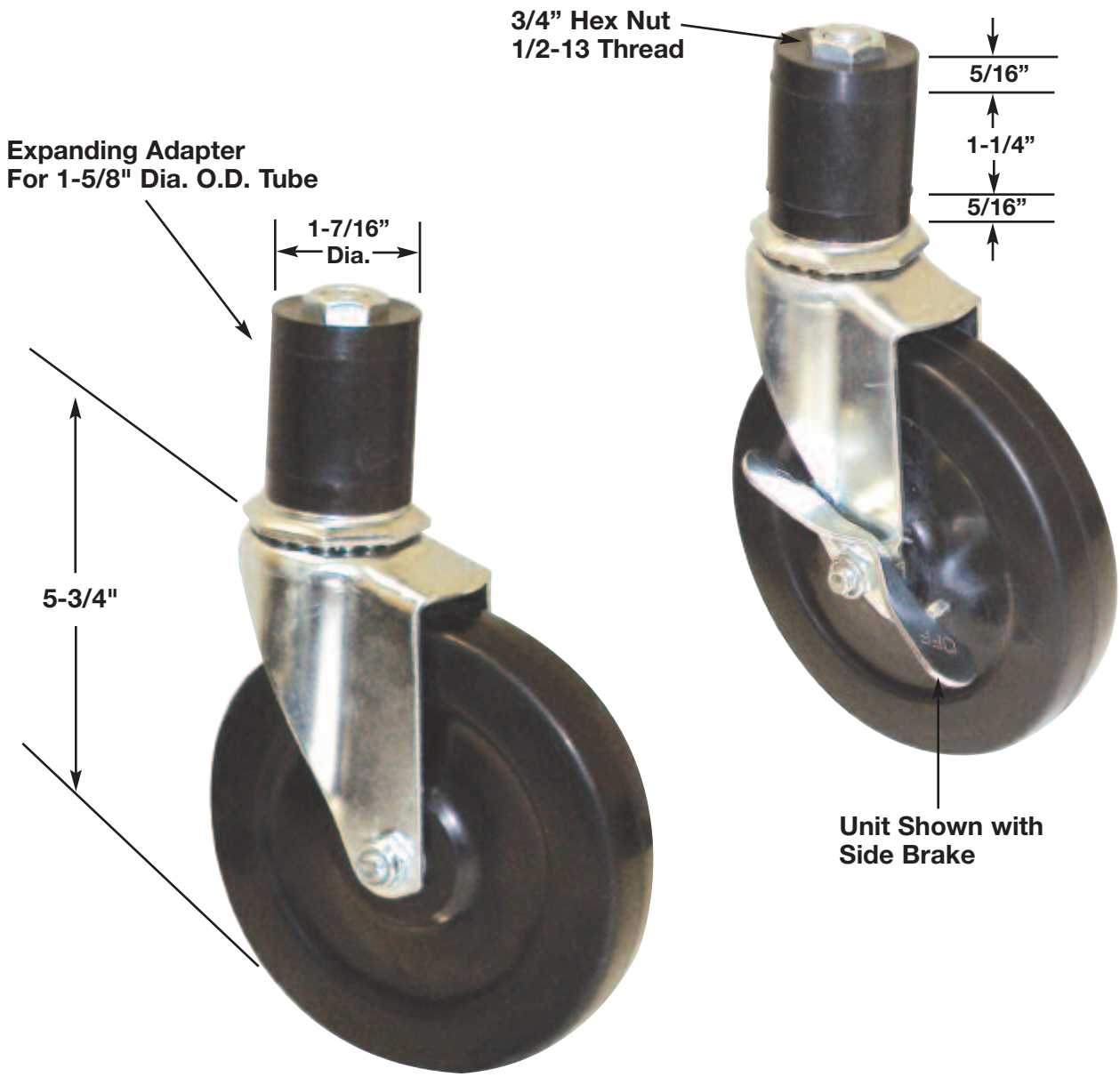
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ACCESSORIES - EXPLODED VIEW
Model: TA-25 Rubber Casters

EACH SET CONSISTS OF 2 CASTERS WITH BRAKE AND 2 CASTERS WITHOUT

TA-25A Available for Set of 6 Casters: 3 with Brakes, 3 without
TA-25B Upgrade Available for Brakes on ALL Casters



5" Dia. x 15/16" Thread Width.
Black, Hard Rubber, DELRIN Bearing Wheel

125 LBS. CAPACITY EACH - TEMPERATURE RANGE = 30° - 160° F

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TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



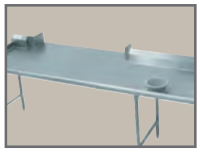
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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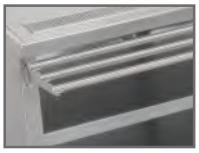
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TABLE MODIFICATIONS & ACCESSORIES

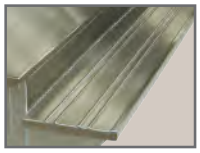
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



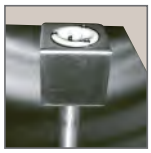
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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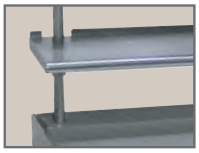
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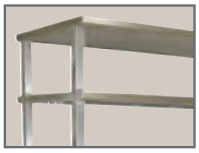
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



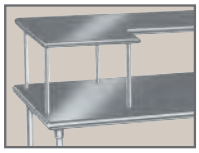
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

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Submittal Sheet

09/15/2026

ITEM# 2.15 - HD RANGE, 36", 6 OPEN BURNERS (1 EA REQ'D)

Vulcan V6B36S

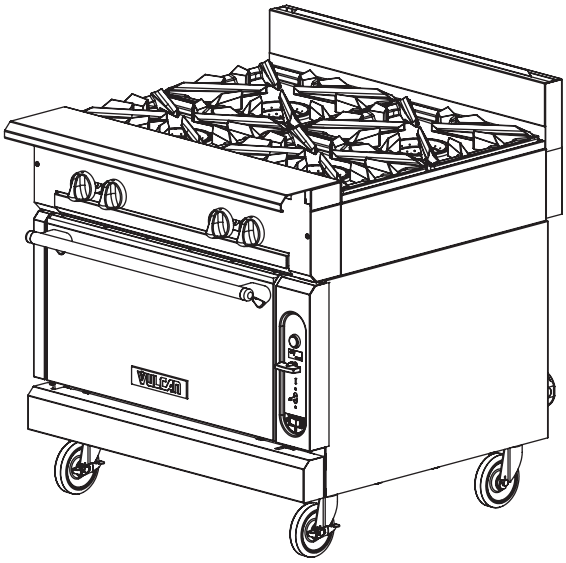
V Series Heavy Duty Range, gas, 36", (6) 35,000 BTU open burners, cast iron grates, standard oven, stainless steel front, front top ledge, sides, base, burner box & stub back, 6" adjustable legs, 260,000 BTU, CSA, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Vulcan	1		Gas type to be specified
Vulcan	1		1-1/4" rear gas connection, standard
Vulcan	1		Rear gas connection: cap & cover, both ends
Vulcan	1	CASTERS-ADJRR4	Casters, 6", adjustable (set of 4) (2 with locks)
Vulcan	1	1INFLEX-4FT	1" X 4' flex hose & quick disconnect with restraining device

HEAVY DUTY COOKING

HEAVY DUTY GAS RANGE
4-BURNERS / 36" WIDE GAS RANGE



Model V4B36C
shown on a convection oven base

- ☐ **V4B36** 4-Burners / Modular
- ☐ **V4B36B** 4-Burners / Cabinet Base
- ☐ **V4B36S** 4-Burners / Standard Oven
- ☐ **V4B36C** 4-Burners / Convection Oven

STANDARD FEATURES

- Stainless steel front, front top ledge, burner box, sides, base, and stub back
- 1¼" diameter front gas manifold with 1¼" rear gas connection (capped)
- 35,000 BTU/hr. open top burners with lift off heads
- 50,000 BTU/hr. standard oven burner
- 32,000 BTU/hr. convection oven burner
- Porcelain oven cavity
- Individual pilots and controls for each burner
- Heavy-duty cast grates
- 4" stainless steel stub riser
- 6" adjustable stainless steel legs for “S”, “C”, and “B” models (no legs for modular model)
- Stainless steel cabinet base door
- Universal rack guides, one removable shelf (cabinet base)
- One year limited parts and labor warranty

OPTIONAL FEATURES (Factory Installed)

- ☐ Cap and cover front manifold
- ☐ Stainless steel oven cavity
- ☐ 650°F oven thermostat and steel hearth (“S” models)
- ☐ Fan cooling package (“C” models)
- ☐ 4" adjustable flanged feet for modular models
- ☐ Less legs for dolly mounting for “S”, “C”, and “B” models
- ☐ 3" high toe base for curb mounting
- ☐ Common condiment type, telescoping plate rails

ACCESSORIES (Packaged & Sold Separately)

- ☐ ¾", 1", or 1¼" gas pressure regulator (specify gas type – pack loose)
- ☐ Set of 4 casters, 6" high (two locking)
- ☐ 6" adjustable flanged feet for “S”, “C”, and “B” models
- ☐ Extra removable shelves for use with Universal rack guides (for cabinet base)
- ☐ Banking strip
- ☐ Common condiment type, telescoping plate rails (starting at 24" length)
- ☐ 10", 22", or 34" high back risers (no shelf)
- ☐ 22" single deck solid or flo-thru high shelf risers
- ☐ 34" double deck solid or flo-thru high shelf risers
- ☐ Dolly frames
- ☐ Flexible gas hose - quick disconnect & restraining device

SPECIFICATIONS

36" wide heavy duty gas range, Vulcan Model No. V4B36 (modular) and V4B36B (cabinet base) or V4B36S (standard oven base) and V4B36C (convection oven base). Modular construction for ease of installation. Stainless steel front, plate ledge, front top ledge with pull-out condiment rails, sides, base, stub back and 6" adjustable legs on all “B”, “S”, & “C” models. Stainless steel extra deep crumb tray. Four 35,000 BTU/hr. cast burners with lift-off burner heads. Individual pilots and controls for each burner. Heavy duty cast burner grates, easy lift-off 11" x 17" in front, 14" x 17" in rear. Grates are separate from aeration bowl for ease of cleaning. **Standard Oven:** 50,000 BTU/hr. with porcelain oven bottom, sides and indoor panel. **Convection Oven:** 32,000 BTU/hr. with porcelain oven bottom, sides and interior door panel (115v-1 phase blower motor, 4 amps, 6' cord and plug). Oven measures 27"w x 27"d x 13"h. Standard oven thermostat adjusts from 150°F – 550°F. Convection oven adjusts from 175°F – 550°F and the optional finishing oven for standard ovens adjusts from 300°F – 650°F. Standard oven supplied with one rack, convection oven with two racks. Both ovens allow for three rack positions. Oven door is heavy duty with counter weight door hinges. 1¼" diameter front gas manifold and 1¼" rear gas connection, capped. Total input 140,000 BTU/hr.

Exterior Dimensions:

36¾"d x 36"w x 36"h on 6" adjustable legs

a division of ITW Food Equipment Group LLC

P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

HEAVY DUTY COOKING

HEAVY DUTY GAS RANGE
4-BURNERS / 36" WIDE GAS RANGE

INSTALLATION INSTRUCTIONS

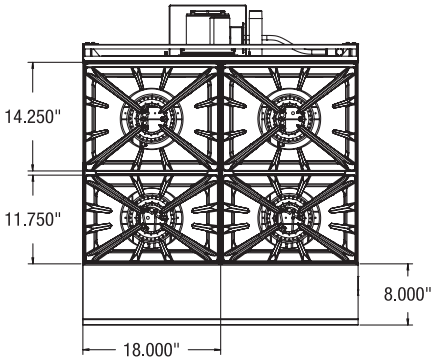
1. A properly sized gas pressure regulator suitable for battery or single unit application must be furnished and installed. Natural gas 6.0" W.C., propane gas 10.0" W.C.
2. An adequate ventilation system is required for commercial cooking equipment. Information may be obtained by writing to the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269, www.NFPA.org. When writing, refer to NFPA No. 96.
3. These units are manufactured for installation in accordance with ANSZ223.1A (latest edition), National Fuel Gas Code. Copies may be obtained from The American Gas Association, 400 N Capitol St. NW, Washington, DC 20001, www.AGA.org.
4. **Clearances**

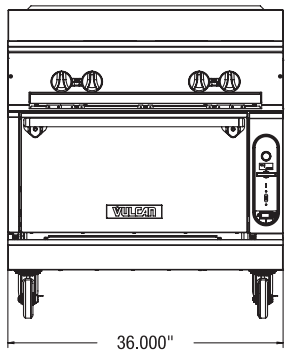
	Rear	Sides
Combustible	10"	10"
Non-combustible	0"	0"

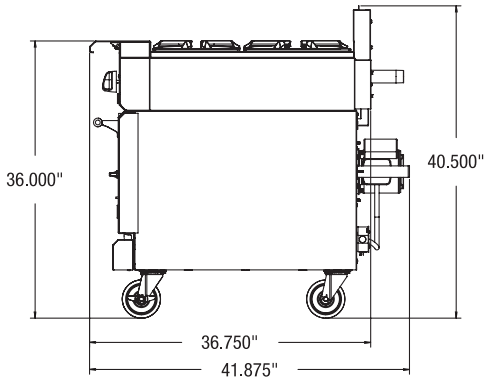
5. For proper combustion, install equipment on adjustable legs or casters. On curb or platform, allow 3½" front overhang. Toe base with leveling bolts are required for curb installation. Specify when ordering.
6. Cannot be batteried with GH series equipment.
7. This appliance is manufactured for commercial installation only and is not intended for home use.

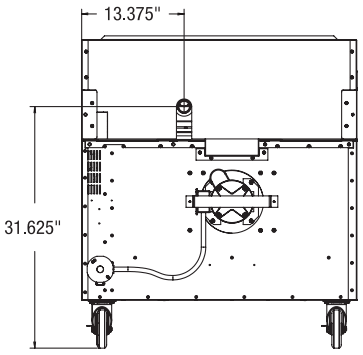
NOTE: In line with its policy to continually improve its product, Vulcan reserves the right to change materials and specifications without notice.

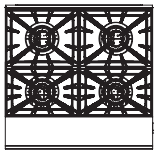
Specify type of gas when ordering.
Specify altitude when above 2,000 feet.









TOP CONFIGURATION	MODEL NUMBER	DESCRIPTION	TOTAL INPUT BTU / HR	SHIPPING WEIGHT LBS / KG
	**V4B36**	4-Burners / Modular	140,000	261 / 119
	V4B36B	4-Burners / Cabinet Base	140,000	380 / 171
	V4B36S	4-Burners / Standard Oven Base	190,000	675 / 304
	V4B36C	4-Burners / Convection Oven Base	172,000	715 / 322

This appliance is manufactured for commercial use only and is not intended for home use.

a division of ITW Food Equipment Group LLC

P.O. Box 696 ■ Louisville, KY 40201 ■ Toll-free: 1-800-814-2028 ■ Local: 502-778-2791 ■ Quote & Order Fax: 1-800-444-0602

NOTE: In line with its policy to continually improve its products, Vulcan reserves the right to change materials and specifications without notice.

11 40 01-188

Submittal Sheet

09/15/2026

ITEM# 2.16 - TILT SKILLET, ELECTRIC (1 EA REQ'D)

Vulcan VPP40E-480

PRECIPAN™ Tilting Braising Pan, electric, 40 gallon usable capacity, multifuntion cooking unit, 80° - 482°F temperature range, multi-zone temperature controlled cooking & multiple timers, auto mode for programed recipes, manual pan or kettle mode, USB port, food probe ready, strainer, motor driven pan tilt/lift, Auto-lift arm (for use with baskets), auto & precise water fill, powered drain without tilting, retractable spray hose, cULus, NSF (V1BPT15E-36)

ACCESSORIES

Mfr	Qty	Model	Spec
Vulcan	1	VPP-STRAINER40	PRECIPAN™ Strainer Kit, for 40 gallon

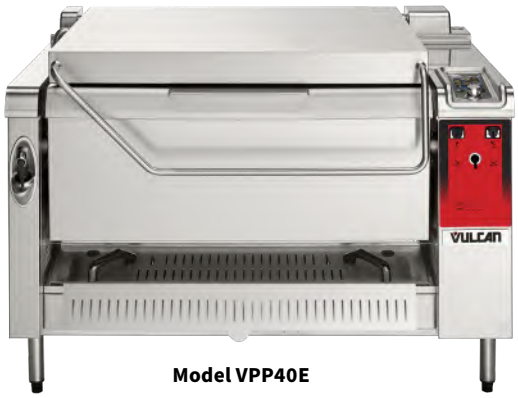
Project 11 40 01-189

AIA # _____ SIS # _____

Item # _____ Quantity _____ C.S.I. Section 114000

PRECIPAN™

Electric Tilting Braising Pan



Model VPP40E

SELL SHEET

c UL us LISTED

CLASSIFIED UL EPH

ANSI/NSF Standard #4

SPECIFIER STATEMENT

Vulcan Precision Pan VPP 28 or 40 gallon usable capacity sized units. Multifunction cooking: Simmer, Grill, Braise, Saute, Pan Fry, Steam, and Boil. Large touch screen with visual display of set and actual temperature 80°-482°F. Auto mode for recipes, preloaded and programmable, up to 5 stages in a cooking cycle. Manual mode with multi-zone temperature controlled cooking and multiple timers. Auto & precise water fill to specific or preset volumes with installation choice for single or dual temperature water control. Embossed gallon and liter markings. Powered touch drain without tilting. Cleaning assist mode with retractable spray hose. Motor driven pan tilt/lift. Auto-lift arm (for use with baskets). Full pour path strainer. Recipe, HACCP recording, and service diagnostic with USB port. Food probe ready. Available in 208, 240, or 480 v/60/3-ph.

UL Listed. UL Listed to Canadian safety standards. Classified by UL to NSF Standard #4.

VPP28E Dimensions:

- External dimensions: 43.3" W x 38.3" D x 39.4" H
- Tank dimensions: 27.3" W x 24.7" D x 10.6" H

VPP40E Dimensions:

- External dimensions: 55.1" W x 38.3" D x 39.4" H
- Tank dimensions: 39.1" W x 24.7" D x 10.6" H

MODELS

- ❑ **VPP-28E-208** (V1BPT10E-86) 28 gallon, 208 V
- ❑ **VPP-28E-240** (V1BPT10E-96) 28 gallon, 240 V
- ❑ **VPP-28E-480** (V1BPT10E-36) 28 gallon, 480 V
- ❑ **VPP-40E-208** (V1BPT15E-86) 40 gallon, 208 V
- ❑ **VPP-40E-240** (V1BPT15E-96) 40 gallon, 240 V
- ❑ **VPP-40E-480** (V1BPT15E-36) 40 gallon, 480 V

STANDARD FEATURES

- Twin control with LCD touchscreen and turn/push knob.
- AUTO mode features preloaded and programmable recipes with picture or text display; additional AUTO options include "My Recipes" and "My Favorites".
- MANUAL mode with multi-zone temperature controlled cooking.
- Pan mode with zones and timers (2 on 28gal, 3 on 40gal models); Kettle mode up to 6 timers along with auto-lift option for baskets.
- Visual display of set and actual temperature, 80-482°F.
- Continuous timer tracks up to 99:00 minutes and seconds. Set, remaining or count time displayed.
- Automatic water filling to specific preset volumes or a desired manual selection, including audible prompt to alert when completed.
- Embossed gallon and liter markings.
- Electronically controlled powered drain allows operators to drain without tilting.
- Motor driven pan tilt/lift and a wide pour path ensures rapid and controlled emptying with minimal pour area.
- Assistance mode for manual cleaning and retractable spray hose.
- Custom settings allow for user personalization, interactive service diagnostics, data collection and operator instructions.
- Automatic preheat function.
- Lid stops in place for vented cooking.
- PC software provided facilitates transfer of recipes, photographs and profiles via USB.
- USB port and multi point food probe socket.
- Auto-lift arm included (for use with baskets).
- One-year limited parts and labor warranty (two-year for K-12).

PRECIPAN™ ELECTRIC TILTING BRAISING PAN

Approved by_____ Date_____ Approved by_____ Date_____

VULCAN

11 40 01-190

PRECIPAN™

Electric Tilting Braising Pan

INCLUDED ACCESSORIES (PACKAGED SEPARATELY)



❑ **VPP-STRAINER28** Strainer for VPP28



❑ **VPP-STRAINER28** Strainer for VPP40

ACCESSORIES (PACKAGED AND SOLD SEPARATELY)



❑ **V-PROBE** Multi-point temperature food probe



❑ **VPP-BASKET** Wire mesh basket (2 for VPP28, 3 for VPP40)



❑ **VPP-SCRAPER** Food scraper



❑ **VPP-BACK28** Back panel enclosure (for VPP28)



❑ **VPP-BACK40** Back panel enclosure (for VPP40)



❑ **VPP-CASTER28** Caster frame kit (for VPP28)



❑ **VPP-CASTER40** Caster frame kit for (for VPP40)



❑ **VPP-CART** Multi-purpose cart on casters holds standard pans and aids when dispensing food from tilted upright position (pans not included)



❑ **VPP-BASEPLATE** Base plate (wire rack) used for steam cooking in PreciPan

As continued product improvement is a policy of Vulcan, specifications are subject to change without notice.

VULCAN

11 40 01-191

PRECIPAN™

Electric Tilting Braising Pan

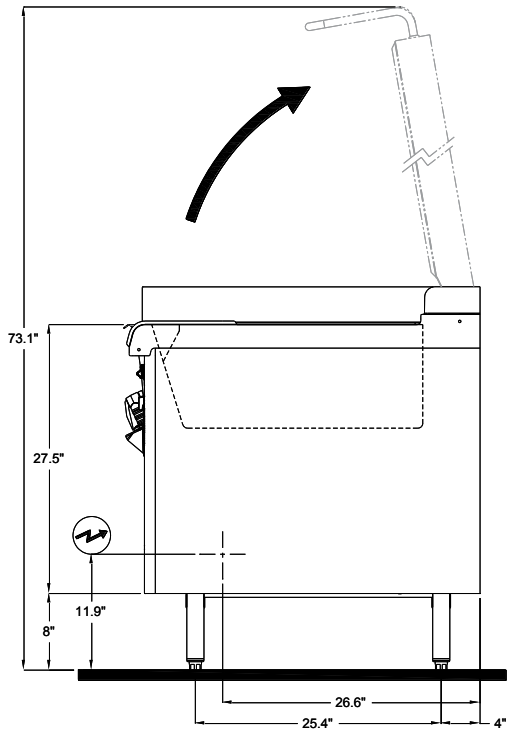
MODEL: VPP28E

SERVICE CONNECTIONS

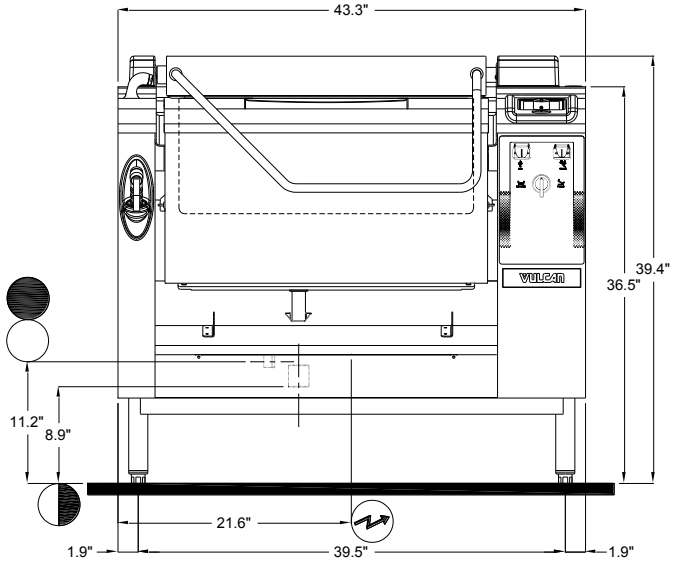
ELECTRICAL CONNECTION:
Heating element, control and motor power

MINIMUM CLEARANCES/WALLS

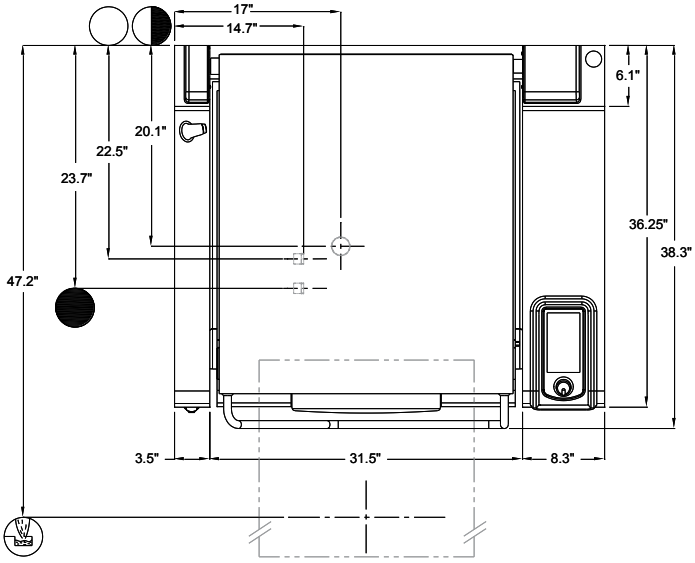
	Left	Back	Right
Standard	0"	0"	0"
To heat source	12"	12"	12"



Side View (VPP28E)



Front View (VPP28E)



Overhead View (VPP28E)

VPP28E Model

Dimensions	
Tank:	27.3" W x 24.7" D x 10.6" H
External:	43.3" W x 38.3" D x 39.4" H
Packaged:	52.8" W x 44.5" D x 50.0" H

Capacity	Weight
28 gal	541 lbs/ 629 lbs packaged

Voltage/Phase	Frequency	kW	Amps
208/3	60 Hz	22.8	63.3
240/3	60 Hz	20.9	50.4
480/3	60 Hz	27.9	33.6

Amperage values in the table are nominal. Tolerance is +5/-10%.
Always refer to the NEC, state and local codes.

Electrical Connection
Electric inlet at 11.9" from the floor (allow a cable with 5' of slack)

Potable Cold Water
Water: ¾" male GHT. Inlet at 11.2" from the floor

Potable Hot Water*
Water: ¾" male GHT. Inlet at 11.2" from the floor
*(*standard delivery: 2-way manifold allows a cold water only connection)*

Drain
1½" diameter. Water outlet at 8.9" from the floor

Floor Trough (optional)
Minimum size 21.6" x 31.5"

Approved by_____ Date_____ Approved by_____ Date_____

11 40 01-192

PRECIPAN™
Electric Tilting Braising Pan

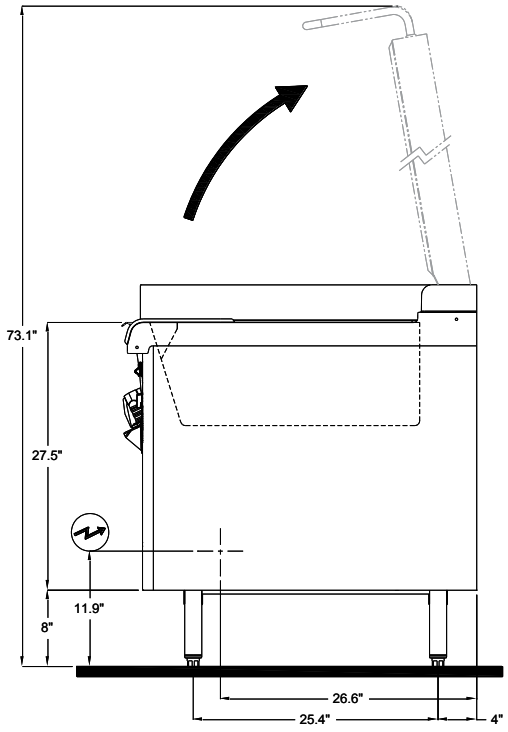
MODEL: VPP40E

SERVICE CONNECTIONS

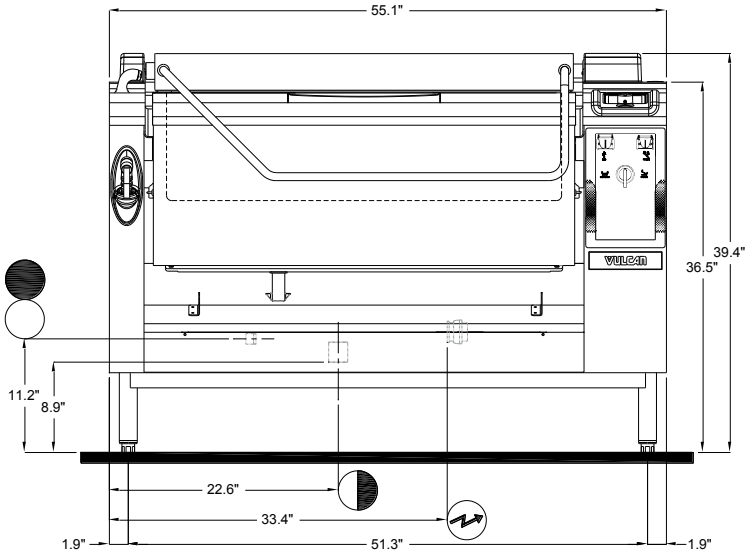
ELECTRICAL CONNECTION:
Heating element, control and motor power

MINIMUM CLEARANCES/WALLS

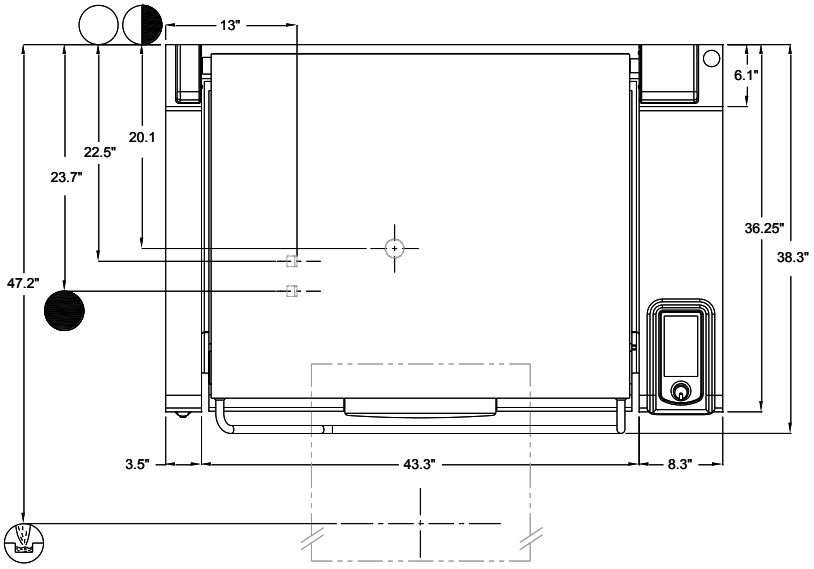
	Left	Back	Right
Standard	0"	0"	0"
To heat source	12"	12"	12"



Side View (VPP40E)



Front View (VPP40E)



Overhead View (VPP40E)

VPP40E Model

Dimensions	
Tank:	39.1" W x 24.7" D x 10.6" H
External:	55.1" W x 38.3" D x 39.4" H
Packaged:	60.6" W x 43.0" D x 50.0" H

Capacity	Weight
40 gal	662 lbs/ 708 lbs packaged

Voltage/Phase	Frequency	kW	Amps
208/3	60 Hz	34.2	95
240/3	60 Hz	31.4	75.6
480/3	60 Hz	41.9	50.3

Amperage values in the table are nominal. Tolerance is +5/-10%.
Always refer to the NEC, state and local codes.

Electrical Connection
Electric inlet at 11.9" from the floor (allow a cable with 5' of slack)

Potable Cold Water
Water: ¾" male GHT. Inlet at 11.2" from the floor

Potable Hot Water*
Water: ¾" male GHT. Inlet at 11.2" from the floor
*(*standard delivery: 2-way manifold allows a cold water only connection)*

Drain
1½" diameter. Water outlet at 8.9" from the floor

Floor Trough (optional)
Minimum size 21.6" x 31.5"

Approved by_____ Date_____ Approved by_____ Date_____

Submittal Sheet

09/15/2026

ITEM# 2.16A - FLOOR TROUGH (1 EA REQ'D)

IMC Teddy ASFT-2436-SG

ASFT Anti-Spill Floor Trough, 36"W x 24"D, 6" deep receptacle, (1) 4" OD tailpiece, stainless steel beehive strainer, 14/304 stainless steel, brushed satin finish, (SG) subway grating, NSF, Made in USA, STOCK ITEM (USUALLY SHIPS IN 1-2 DAYS)

ACCESSORIES

Mfr	Qty	Model	Spec
IMC Teddy	1	HDCI	HDCI HydroCool Insert, 18ga type 304 stainless steel, insert has perforated bottom with 1⁄32" seepage holes, 1" x 7½" long overflow holes are provided on both sides of insert, 1¾" wide flanges on length sides, drain tempering valve, flexible hose with water hammer arrestor & backflow preventer, one piece assembly plus the grating section, patent pending, trough sold separately, made in USAPATENT PENDING, TROUGH SOLD SEPARATELY, Made in USA

IMC/TEDDY
DECADES OF FINE CRAFTSMANSHIP

11 40 01-194

ASFT
Anti-Spill Floor Trough

General Information

Project Name: _____

Consultant: _____

Item #: _____

Model #: _____

Quantity: _____



Shown with
Subway Grating (SG)

Specifications

ASFT Floor Troughs are 14GA type 300 series stainless steel. Horizontal corners are coved and the trough is integrally pitched toward a waste outlet with a stainless steel beehive strainer and a 4" OD tailpiece.

Anti-Spill features are built into the trough, which is 6" deep.

Recessed flange and 1" deep ledge for IMC grating are integral with the unit.

Joints are TIG welded and leakproof. Exposed surfaces finished brush satin.

Product Guide

Use in Commercial and Institutional Buildings or large food prep facilities for high volume, rapid discharge application.

Anti-Spill feature directs splashing waste water to inside corners of the trough away from the equipment.

Recessed outer flange supports floor tile and provides a grout pocket.

Setting frame for waterproof membrane and/or integral seepage flange with "weep" holes can be added for wet floor areas.

Extension arms and intersections available for multiple equipment layout.

Options*

- ☐ **DOD** - 3", 3½", 5", 6", 8" OD Tube (circle one)
- ☐ **WTO** - Waste Tube over 3" Long
- ☐ **AW** - Additional Wastes
- ☐ **WCP** - Waste Cup Strainers
- ☐ **BH** - Beehive Strainers (Each)
- ☐ **OCW** - Off Center Waste (Each)
- ☐ **ST12** - Scrap Tray Up to 18" Wide
- ☐ **PWT** - Perforated Waste Pipe
- ☐ **SF-2** - Special Size Setting Flange 2" Deep
- ☐ **SF-4** - Special Size Setting Flange 2" to 4" Deep
- ☐ **OWT** - Oversize Waste Tube
- ☐ **FSG** - Seepage Flange w/ Weep Holes
- ☐ **ST20** - Scrap Tray 20" Long
- ☐ **DSE** -Drain on the End
- ☐ **ROD** - Rim on Drain
- ☐ **BSPC** - Basket Strainer w/ Handle & Chain
- ☐ **BXD** - Box Type Drain
- ☐ **BSX** - Beehive Strainer for Box Drain
- ☐ **GA-12** - 12GA Upgrade

***See Price List for Complete Options**

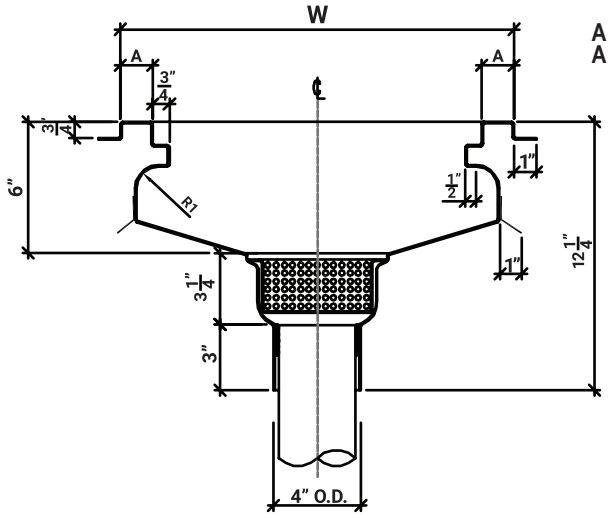
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IMC/TEDDY
DECADES OF FINE CRAFTSMANSHIP

11 40 01-195

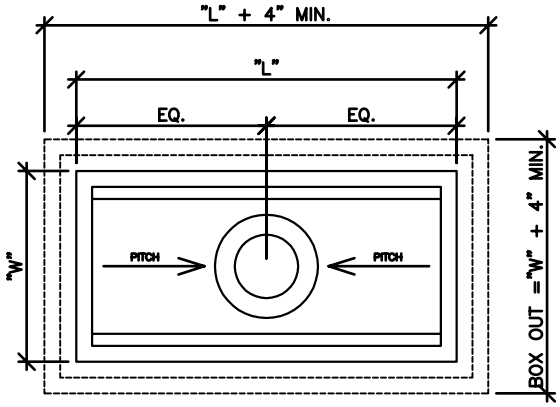
ASFT
Anti-Spill Floor Trough

DRAWINGS



A = 1" for Troughs up to 15" Wide
A = 1 1/2" for Troughs over 15" Wide

Box Out Size



Trough Area

- Width (PIT) = Width ("W") + 4" Minimum
- Length (PIT) = Length ("L") + 4" Minimum
- Depth (PIT) = Depth of Trough + 1/2" + Finish Floor
- Size of Rough-In Hole For Drains $7^{1/2}$ 0 Minimum

ANTI-SPILL FLOOR TROUGHS

Model	Size (W x L)	Model	Size (W x L)	Model	Size (W x L)	Model	Size (W x L)
☐ ASFT-1218	12" x 18"	☐ ASFT-1824	18" x 24"	☐ ASFT-2430	24" x 30"	☐ ASFT-3036	30" x 36"
☐ ASFT-1224	12" x 24"	☐ ASFT-1830	18" x 30"	☐ ASFT-2436	24" x 36"	☐ ASFT-3048	30" x 48"
☐ ASFT-1230	12" x 30"	☐ ASFT-1836	18" x 36"	☐ ASFT-2448	24" x 48"	☐ ASFT-3060	30" x 60"
☐ ASFT-1236	12" x 36"	☐ ASFT-1848	18" x 48"	☐ ASFT-2460	24" x 60"	☐ ASFT-3072	30" x 72"
☐ ASFT-1248	12" x 48"	☐ ASFT-1860	18" x 60"	☐ ASFT-2472	24" x 72"	☐ ASFT-3084	30" x 84"
☐ ASFT-1260	12" x 60"	☐ ASFT-1872	18" x 72"	☐ ASFT-2484	24" x 84"	☐ ASFT-3096	30" x 96"
☐ ASFT-1272	12" x 72"	☐ ASFT-1884	18" x 84"	☐ ASFT-2496	24" x 96"	☐ ASFT-30108	30" x 108"
☐ ASFT-1284	12" x 84"	☐ ASFT-1896	18" x 96"	☐ ASFT-24108	24" x 108"	☐ ASFT-30120	30" x 120"
☐ ASFT-1296	12" x 96"	☐ ASFT-18108	18" x 108"	☐ ASFT-24120	24" x 120"		
☐ ASFT-12108	12" x 108"	☐ ASFT-18120	18" x 120"	☐ ASFT-3024	30" x 24"		
☐ ASFT-12120	12" x 120"	☐ ASFT-2424	24" x 24"	☐ ASFT-3030	30" x 30"		

Note - Standard troughs up to 96" have one (1) waste at center. Over 96", troughs have two (2) wastes equidistant.

Specifications subject to change without notice.

ASFT-90 0321

IMC/TEDDY
DECADES OF FINE CRAFTSMANSHIP

11 40 01.196

HDCI
HydroCool Insert

General Information

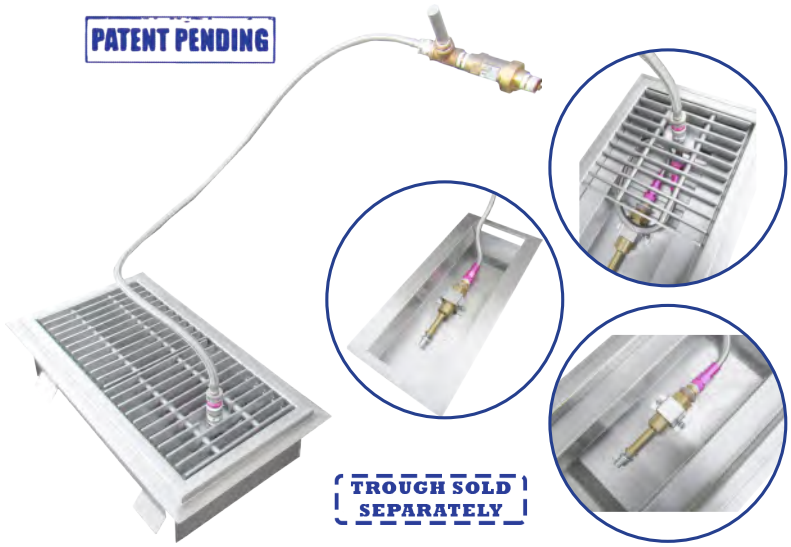
Project Name: _____

Consultant: _____

Item #: _____

Model #: _____

Quantity: _____



PROUDLY MADE IN THE USA

Specifications

HDCI Model HydroCool Insert is constructed of 18GA Type 304 stainless steel.

Insert has perforated bottom with 1/32" seepage holes. 1" x 7½" long overflow holes are provided on both sides of insert, hemmed for strength. 1¾" wide flanges on length sides sits on grating ledge inside of trough.

A drain tempering valve is secured to insert with "U" channel & tamperproof screws. Quick connector is welded to grating section.

Flexible hose with water hammer arrestor & backflow preventer gets screwed into quick connector, which connects to the facility cold water line to backflow preventer. Valve is triggered when drainage fluids are at or above 110°F.

The HydroCool Insert is a one piece assembly plus the grating section.

Product Guide

Use for Commercial and Institutional Buildings or large food prep facilities where hot water discharge must be cooled. Typical uses would be under a tilt skillet or kettle.

In some applications, plumbing codes require hot drain water (above 140°F) to either be cooled or to drain into a pipe that can withstand hot water. The HydroCool Insert cools this hot water so that operators are compliant with plumbing codes.

HydroCool Insert can be used with IMC troughs or can be retrofitted in the field.

Please see installation manual for detailed operation.

Options

- ☐ **Custom Sizes** - ____ x ____
- ☐ Replacement Valve
- ☐ Replacement Grating with Connector
- ☐ Replacement Plumbing Assembly

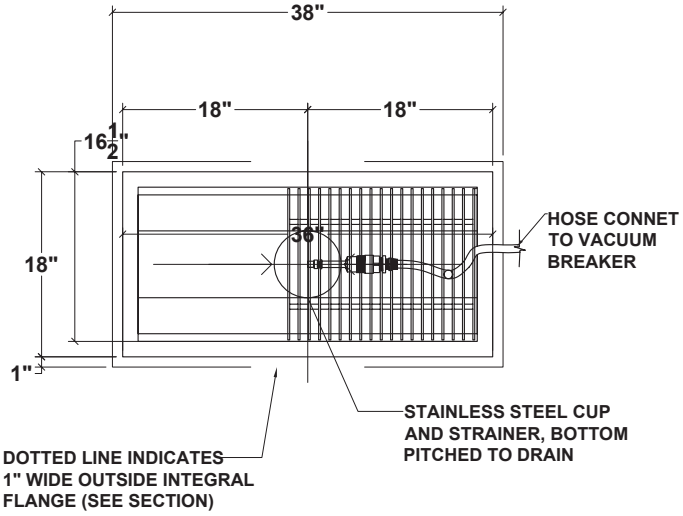
HDCI-10 0225

IMC/TEDDY
DECADES OF FINE CRAFTSMANSHIP

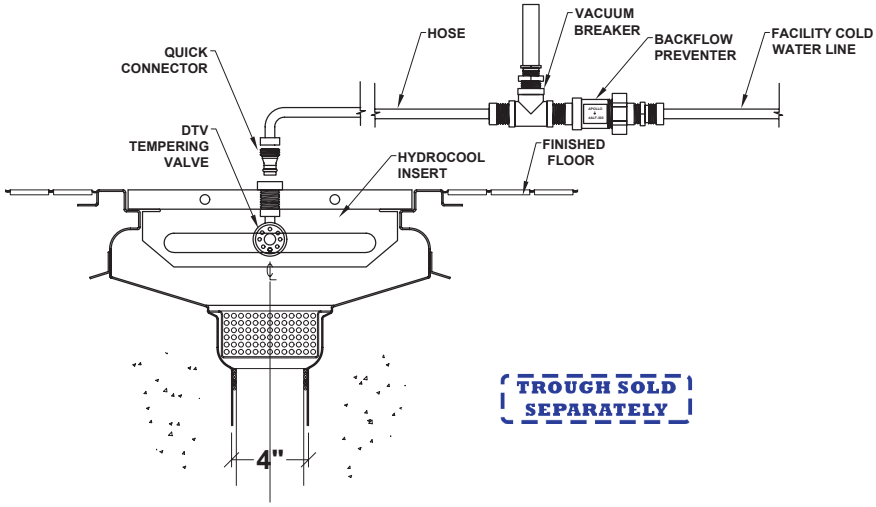
11 40 01.197
HDCI
HydroCool Insert

DRAWINGS

TROUGH SOLD SEPARATELY

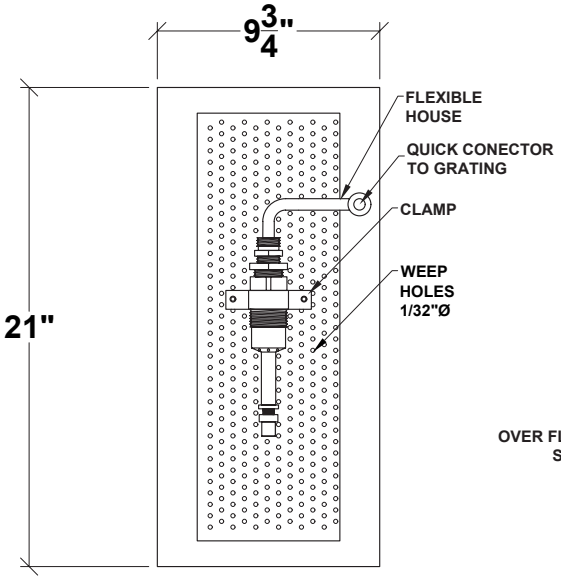


PLAN

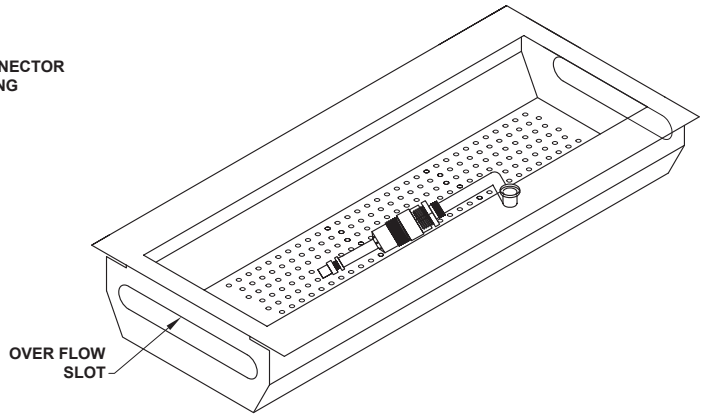


TROUGH SOLD SEPARATELY

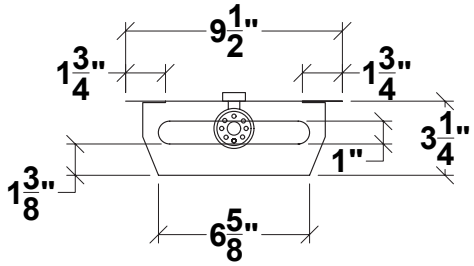
SECTION VIEW



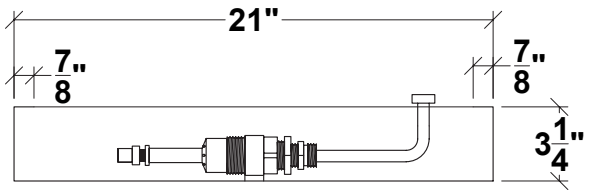
PLAN



ISOMETRIC



FRONT VIEW



SECTION VIEW

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11 40 01-198

Submittal Sheet

09/15/2026

ITEM# 2.17 - CONVECTION OVEN, GAS (EXISTING/RELOCATED) (1 REQ'D)

Custom EXISTING / RELOCATED

EXISTING / RELOCATED

11 40 01-199

Description: CONVECTION OVEN, GAS (Existing/Relocated)

Notes: EXISTING / RELOCATED

11 40 01-200

Submittal Sheet

09/15/2026

ITEM# 2.18 - COMBI OVEN, ELECTRIC (1 EA REQ'D)

RATIONAL ICP 6-FULL ON 10-FULL E 480V 3 PH

One (1) (CC1ERRA.0000219) iCombi Pro® 6-Full Size Combi Oven on one (1) (CE1ERRA.0000222) iCombi Pro® 10-Full Size Combi Oven, double stack, electric, (16) 18" x 26" sheet pan or (32) 12" x 20" steam pan or (16) 2/1 GN pan capacity, (8) stainless steel grids included, intelligent cooking system with (4) assistants; iDensityControl, iCookingSuite, iProductionManager, & iCareSystem, (6) operating modes, (5) cooking methods, (3) manual operating modes, 85° to 572°F temperature range, quick clean, care control, eco mode, 6-point core temperature probe, retractable hand shower, Ethernet interface, Wi-Fi enabled, 22.4/CE, IPX5, UL, cULus, NSF, ENERGY STAR®

ACCESSORIES

Mfr	Qty	Model	Spec
RATIONAL	1	60.74.725	Combi-Duo Stacking Kit for iCombi 6-full size (electric or gas) on iCombi 6- or 10-full size (electric only)

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Datasheet

iCombi® Pro 6-full size + 10-full size E UG



Capacity
> Sixteen (16) Half-size sheet pans or Thirty two (32) Steam table pans or Sixteen (16) 1/1 GN accessories
> Removable standard hinging rack with 2 5/8 inch rack spacing (68 mm)
> Large selection of accessories for various cooking procedures, such as grilling, braising or baking
> For use with 2/1, 1/1, 2/4 GN accessories

Combi-steamer mode
> Steaming 86 °F - 266 °F
> Convection 86 °F – 572 °F
> Combination of steam and convection 86 °F – 572 °F

Description
Two intelligent, network-compatible cooking systems with poultry, meat, fish, egg-based dishes/desserts, side dishes/vegetables, baked goods modes as well as pan frying, grilling, steaming, baking, and finishing cooking methods.
> Combi steamer as per DIN 18866 (in manual mode).
> For most cooking processes used in commercial kitchens.
> For using steam and convection, individually, one after the other, or combined.

Ventilation approvals: This appliance conforms to the EPA 202 test in accordance with ANSI/NFPA 96 "Ventilation Control and Fire Protection of Commercial Cooking Operations" Refer to UL Listing KNLZ.E148536 (America) or KNLZ7.E148536 (Canada).
The following intelligent assistants are available:

Intelligent assistant
iDensityControl iProductionManager iCookingSuite iCareSystem

iDensityControl
iDensityControl is the iCombi Pro's intelligent climate management. The interaction among intelligent sensors, a high-performance heating system and fresh steam generator, and active dehumidification ensures that the right cooking cabinet climate is always available. Intelligent air circulation ensures the best possible energy input into the food. Consequently, this ensures extraordinary productivity while maintaining high levels of food quality, even cooking and minimum energy consumption.

iCookingSuite
The iCookingSuite is the iCombi Pro's cooking intelligence. The user starts by selecting the right cooking path for the food, choosing from among 6 operating modes and / or 5 cooking methods. Users also specify the desired cooking result. The unit suggests settings for browning and degree of doneness. Intelligent sensors detect the size, quantity and condition of the food. While the cooking path is in progress, the system adjusts key parameters like cooking cabinet temperature, airspeed, and cooking time accurately to the second. The selected desired results are achieved, yielding the best possible quality in the shortest possible time. It is possible to optionally influence the cooking sequence and adapt the cooking result. Users can change to iProductionManager or manual mode at any time. Thanks to iCookingSuite you can simply save time, raw materials, and energy while maintaining a standardized food quality without having to check the procedure.

iProductionManager
iProductionManager intelligently and flexibly organizes the production process. This includes which products can be prepared together on different trays, the ideal sequence of dishes, and monitoring the cooking sequence. iProductionManager supports users with prompts to load or unload dishes. Depending on kitchen processes you can freely position orders (up to two per level) or schedule them on the basis of a certain target time. iProductionManager arranges the sequence of dishes accordingly and automatically specifies the correct settings. Users decide whether dishes are cooked based on optimum energy consumption or a certain target time. Simple monitoring activities are no longer required, saving you working time and energy.

iCareSystem
The iCareSystem is the intelligent iCombi Pro cleaning and descaling system. It recommends the amount of chemicals and ideal cleaning stage from the nine available programs based on usage and any limescale in the steam generator. Ultra-fast interim cleaning cleans iCombi Pro in only 12 minutes, all cleaning programs can also run overnight without the need for supervision. The iCareSystem is particularly efficient and environmentally friendly, consuming small quantities of phosphate-free care products, water, and energy. This means that the iCombi Pro is always hygienically clean without manual work and at minimal costs.

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Unit description and functions

Intelligent functions

> Intelligent climate management that measures, adjusts and controls the humidity down to the exact percentage
> The actual measured humidity in the cooking cabinet can be adjusted and viewed
> Dynamic air turbulence in each cooking cabinet thanks to one or two intelligent, reversible, high-performance fan wheels with five fan wheel speeds, intelligently actuated and manually programmable
> Intelligent cooking path regulation and automatic adjustment of cooking steps in order to achieve the target results, e.g., browning and degree of doneness, safely and efficiently - regardless of product size, load quantity, or who is using the unit
> Monitoring accurate to the second and calculation of browning on the basis of the Maillard reaction to reproduce ideal cooking results
> Adjust intelligent cooking methods or switch between iCookingSuite and iProductionManager for maximum flexibility
> Intelligent cooking step to proof baked goods
> Individual, intuitive programming of up to 1,200 cooking programs with up to 12 steps using drag-and-drop, per cooking system
> Easy transfer of cooking programs to other cooking systems through secure cloud connection with ConnectedCooking or via USB stick
> iProductionManager, the automated, intelligent planning and controlling tool, organizes multiple cooking processes and mixed loads perfectly. Automatic closing of planning gaps. Automatically optimize schedules and energy consumption in planning and target time preparation to start or end cooking dishes at the same time.
> Visual indication of loading and removal requests using energy-saving LED lighting
> Automatically resumes and optimally completes cooking processes following power outages lasting less than 15 minutes
> Intelligent cleaning system suggests cleaning programs and the required amount of care products based on the degree of soiling within the cooking system
> Display of the current cleaning and descaling status
> Condensation/exhaust air hoods (accessories) with situational adjustment of the extraction performance and transfer of service messages.

Cooking functions

> High-performance steam generator for optimal steaming performance even at low temperatures below 212°F
> Power-steam function: increased steaming power available for Asian applications
> Integrated, maintenance-free grease separation system without an additional grease filter
> Cool-down function to quickly cool down the cooking cabinet; additional fast cooling using internal water nozzle
> Core temperature probe with six measuring points and automatic error correction in the event of incorrect positioning. Optional positioning tool for soft or very small cooking products (accessory)
> Delta-T cooking for extremely gentle preparation with minimal cooking losses
> Precise burst-steam injection; water quantities can be set to 4 different levels within a temperature range of 85°F – 500°F for convection or steam-convection combination modes
> Digital temperature display, can be set to °C or °F, displays target and actual values
> Cooking cabinet humidity and time displayed digitally; displays target and actual values
> Time can be set to display in 12- or 24-hour format
> 24-hour real-time clock with automatic adjustment for daylight savings time when connected to ConnectedCooking
> Automatic pre-selected starting time with variable date and time
> Integrated hand shower with automatic retraction and switchable spray/jet function
> Energy-saving, long-lasting LED lighting in the cooking cabinet, with excellent color fidelity to allow quick determination of cooking progress
> No-charge 4-hour RATIONAL certified chef assistance program

Occupational and operating safety

> Electronic safety temperature limiter for steam generator and convection heating
> Integrated fan wheel brake
> Contact temperature of the cooking cabinet door max. 163 °F
> Use of Active Green cleaning tabs and Care tabs (solid cleaning agent) for ideal occupational safety levels
> HACCP data storage and output via USB or optional storage and management in the cloud-based networking solution ConnectedCooking
> Tested according to national and international standards for unsupervised operation
> Ergonomic door handle with right- / left-handed door opening and swing-shut function

Networking

> Integrated, IP-protected Ethernet interface for wired connection to the cloud-based ConnectedCooking networking solution or for networking with each other
> Integrated Wi-Fi interface for wireless connection to the cloud-based networking solution ConnectedCooking
> Integrated USB interface for local data exchange
> Cloud-based ConnectedCooking solution allows central unit management; recipe, shopping cart and program management; HACCP data management; maintenance management

Cleaning and care

> Automatic, water pressure-independent cleaning and maintenance system for cooking cabinet and steam generator
> Nine cleaning programs for unsupervised cleaning, also overnight, with automatic cleaning and removal of limescale deposits within the steam generator
> Ultrafast cleaning in only 12 minutes for practically uninterrupted, hygienic production
> Automatic cleaning routine following power outages, ensuring that cooking cabinet remains free of cleaning agents even after the cleaning process has been canceled
> Use of phosphate and phosphorus-free Active-Green cleaning agent tabs and Care tabs
> Hygienic setup that is flush with the counter without feet for simple, safe cleaning

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> Triple glass pane cooking cabinet door with rear ventilation, thermally reflecting special coating and swiveling glass panes for easy cleaning
> Inside and outside material: stainless steel DIN 1.4301 / ASTM 304, seamless hygienic cooking cabinet with rounded corners and optimized air flow
> Glass and stainless steel surfaces allow easy, safe external cleaning; IPX5-class protection against spraying water in all directions
> Monitoring option for automatic cleaning using the cloud-based ConnectedCooking networking solution

Operation

> High-resolution 10.1 inch TFT color display and capacitative touchscreen with self-explanatory icons for simple, intuitive operation with gestures like swiping and dragging
> Acoustic prompts and visual messages when user action is required
> Central dial with Push function for intuitive selection and confirmation of entries
> User interface and help function can be set to over 55 languages
> Basic national cuisine preferences can be selected regardless of language settings. Possible to select additional, local cuisine
> Specially adapted cooking parameters for international or country-specific dishes can be selected and started regardless of unit language settings
> Extensive search function including all cooking paths, application examples and settings
> Context-sensitive support that always shows the current help content for the displayed screen content
> Start application examples from help file
> Simple selection of cooking paths using six operating modes and/or five cooking methods
> Cockpit function to display information about the processes within a cooking path
> Customization and control of user profiles to prevent operator errors
> Interactive notifications regarding cooking paths, requested actions, intelligent functions and warnings thanks to Messenger
> Use the upper unit to control the lower unit conveniently and ergonomically

Installation, maintenance and environment

> Professional installation by RATIONAL-certified technicians recommended
> Fixed waste water connection conforming to SVGW requirements is permitted
> Adaptation to the installation site (height above sea level) through automatic calibration
> Operation without water softener and without additional manual descaling possible
> Installation flush with the floor and wall through connection in the base area *
> Installation variations with RATIONAL Stand I (standard, mobile, with fixing) or RATIONAL Stand II (standard, mobile)
> Service diagnostic system with automatic service message display, self-test function for active testing of unit functions
> Remote diagnosis via ConnectedCooking by certified RATIONAL service partners
> 2-year RATIONAL warranty including parts, labor, and travel and 5-year steam generator warranty**
> Regular maintenance is recommended. Servicing by RATIONAL service partner according to manufacturer recommendations
> Energy-efficiency tested as per DIN 18873 and consumption values published in HKICert database
> Energy efficiency in accordance with ENERGY STAR tested and passed. Published at www.energystar.gov

* See the installation or planner manual for details

** Terms and conditions apply, see manufacturer warranty statement at www.rational-online.com

Options

> Cooking cabinet door, left-hinged
> MarineLine - marine version
> SecurityLine – prison / security version
> HeavyDutyLine – particularly heavy-duty version
> Integrated fat drain
> Safety door lock
> Lockable control panel
> Mobile oven rack package for Combi-Duo

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Technical specifications

Dimensions and weights

Dimensions (W x H x D)	
Cooking system (total, incl. Stand I)	42 1/4 x 81 7/8 x 44 3/4 inches
Cooking system (total, incl. stand with rollers)	46 x 77 x 44 3/4 inches

Weights	
Net weight cooking system incl. Combi-Duo kit and Stand I	767 lb
Maximum load size per level	66/66 lb
Maximum total load capacity	132/198 lb

Each cooking system is individually

Electrical connection conditions

Voltage 3 AC 208 V / 240V	6-full size	10-full size
Connected loads - electric	22.4 kW	37.4 kW
Steam power	18 kW	36 kW
Convection power	21.6 kW	36 kW
Breaker	70 A	125 A
Connection impedance	0.09 Ω	0.09 Ω
RCD type	B	B
Cable diameter	AWG 3 140°F	AWG 2 194°F
Voltage 3 AC 440 V / 480 V	**6-full size**	**10-full size**
Connected loads - electric	22.4 kW	37.4 kW
Steam power	18 kW	36 kW
Convection power	21.6 kW	36 kW
Breaker	35 A	60 A
Connection impedance	0.09 Ω	0.09 Ω
RCD type	B	B
Cable diameter	AWG 8 140°F	AWG 4 140°F

Connection conditions water

Water inlet (pressure hose), each	3/4"
Water pressure (flow pressure), each	14.5-87.0 psi
Water drain, each	2" OD
Maximum flow rate per cooking system	3.17 gal/min

Water quality requirements

Untreated water can be 0 to 24.5 gr/gal (0 to 420ppm) hardness. We do not recommend treated water hardness < 5 gr/gal (86ppm) because the water could be corrosive. Sodium ion exchangers are not recommended; H+ Ion exchange systems are recommended. Water that does not meet the following minimum standards will require the proper conditioning

Contaminant	Water Requirements	If > than recommended
Sand / Particles	< 15 µm	Particle filter
Chlorine (Cl2)	< 0.12 gr/gal (0.2 ppm)	Active carbon filter
Chloride (Cl-)	< 4.68 gr/gal (80 ppm)	RO

Connection loads - data

LAN data interface	RJ45
WiFi data interface	IEEE 802.11 a/g/n

Minimum distances at installation

Clearance Requirements
To facilitate servicing, we recommend leaving a 20" (500 mm) gap on the left-hand side of the unit. If there is not 20" (500 mm) left side clearance available, provisions for moving the unit to the left for service access must be made. Such provisions include, but are not limited to, having quick connections (water, gas, etc.) and lengthened electrical connections with flexible cords.
If there are no external heat sources acting on the unit, there should be at least 2" (50 mm) of clearance on either side of the unit. The back of the unit can be mounted flush with the wall.
If a high temperature heat source is on the left side of the unit, clearance of at least 14" (350 mm) must be maintained on the left-hand side. This clearance may be reduced to 2" (50 mm) if a heat shield is used (see accessories).
Recommended clearance from unobstructed rear exhaust pipes and any surface collecting grease or flammable material; 16" (400 mm) gas, 10" (254 mm) electric. It is recommended to have a hood overhang of 6" (150 mm) to 18" (450 mm) at the front of the unit and 6" (150 mm) on the sides if installed at the end of the cooking line. Please refer to the Installation Manual for additional technical data and for instructions on installation and setup.

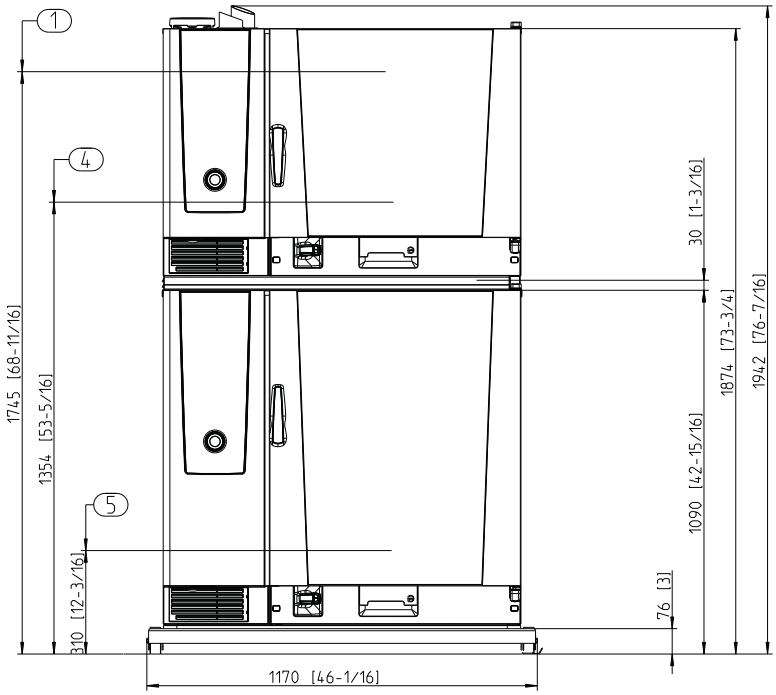
Terms and conditions of installation

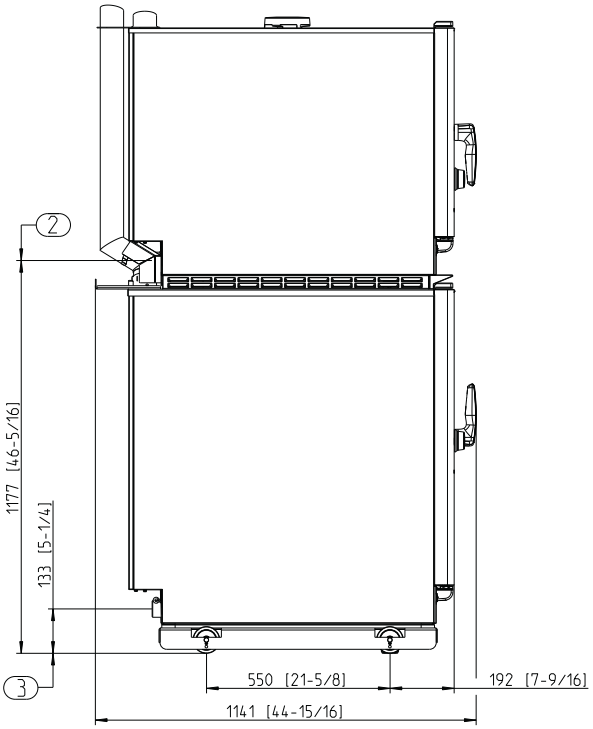
> Observe all local and country-specific standards and regulations regarding the installation and operation of industrial cooking appliances. The local standards and regulations for interior ventilation systems must also be taken into account.
> To use ConnectedCooking, an RJ45 network socket or a WLAN connection option (IEEE 802.11 a/g/n) must be in place on-site. For optimal performance, a data rate of at least 100 MB/s is required.

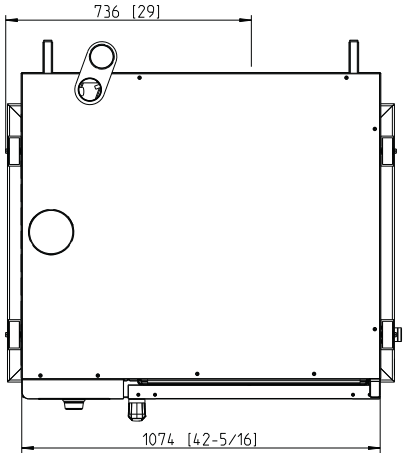
Approvals

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Technical drawing, electrical - stand with rollers







1	Top rack height
2	Water drain height - top unit
3	Water drain height - bottom unit
4	Rack loading height - top unit
5	Rack loading height - bottom unit

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Accessories

> 8 full size stainless steel grids included with delivery of the cooking system

Accessories	Item number
RATIONAL Active Green cleaning agent tabs – guarantee the best cleaning performance	Item no. 56.01.535
RATIONAL Care tabs – effectively prevent limescale deposits	Item no. 56.00.562
Mobile oven rack and mobile plate oven rack – for simple loading outside the cooking system	See Cooking Systems and Accessories catalog
Condensation breaker – diverts steam and vapors to an existing exhaust air system Sizes 6-half size, 10-half size, 6-full size and 10-full size	Item no. 60.72.592
RATIONAL USB stick – to securely transfer cooking programs and HACCP data	Item no. 42.00.162
Combi-Duo run-in rail for mobile rack and mobile plate rack Size 6-full size, 10-full size	Item no. 60.75.760
Finishing system for banquets Size 10-full size, 42 plates	Item no. 60.12.154
Finishing system for banquets Size 6-full size, 34 plates	Item no. 60.62.196
Finishing system for banquets Size 10-full size, 52 plates	Item no. 60.12.155
Full size sheet pan adapter	Item no. 60.12.156
Hinging racks - Size 6-full size	Item no. 7 racks 60.62.168 Item no. 5 racks 60.62.171
Heat shield – for installing a unit near a heat source, e.g. a grill - Size 10-full size	Item no. left hinged door 60.776 Item no. right hinged door 60.75.774
Heat shield – for installing a unit near a heat source, e.g. a grill - Size 6-full size	Item no. left side 60.75.769 Item no. right side 60.75.768
Stackable Combi-Duo kit Size 6-half size E/G on Size 6-half size E or Size 10-half size E	Item no. 60.74.725
RATIONAL Double Water Filter - for Combi Duo 6-full size/6-full size and 6-full size/10-full size or if used for more than 2 units	Item no. 1900.1150US
Stands are available in various versions - standard, with casters, or with anchorable stainless steel feet	See Cooking Systems and Accessories catalog
UltraVent recirculating hood –for Combi-Duo 6-full size, 10-full size electrical units only	Item no. 60.76.180
UltraVent Plus recirculating hood – for electrical units only – Combi-Duo 6-full size, 10-full size	Item no. 60.76.178

We offer a wide range of cooking accessories to help you achieve ideal cooking results; for more information, please consult our accessories brochure, ask your dealer, or visit www.rational-online.com

Planner	RATIONAL USA Inc.
	1701 Golf Road, Suite C-120, Commercium Rolling Meadows, IL 60008 Toll Free: 888-320-7274 Fax: 847-755-9583 Email: info@rational-online.com Visit us on the internet: www.rational-online.com

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Submittal Sheet

09/15/2026

ITEM# 2.19 - COMBI OVEN, ELECTRIC (1 EA REQ'D)

RATIONAL ICP 20-FULL E 480V 3 PH (LM100GE)

(CG1ERRA.0000228) iCombi Pro® 20-Full Size Combi Oven, electric, (20) 18" x 26" sheet pan or (40) 12" x 20" steam pan or (20) 2/1 GN pan capacity, mobile oven rack & (10) stainless steel grids included, intelligent cooking system with (4) assistants; iDensityControl, iCookingSuite, iProductionManager, & iCareSystem, (6) operating modes, (5) cooking methods, (3) manual operating modes, 85° to 572°F temperature range, quick clean, care control, eco mode, 6-point core temperature probe, retractable hand shower, Ethernet interface, Wi-Fi enabled, IPX5, UL, cULus, NSF

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Spec sheet

iCombi® Pro 20-full size E/G



Description

Intelligent, connectable cooking system with the operating modes poultry, meat, fish, egg dishes/desserts, side dishes/vegetables, baked goods and finishing as well as the cooking methods roasting, cooking, baking and grilling.

> Combi steamer as per DIN 18866 (in manual mode).
> For most cooking processes used in commercial kitchens.
> For using steam and convection, individually, one after the other, or combined.

Ventilation approvals: The electrical appliance conforms to the EPA 202 test in accordance with ANSI/NFPA 96 "Ventilation Control and Fire Protection of Commercial Cooking Operations" Refer to UL Listing KNLZ.E148536 (America) or KNLZ7.E148536 (Canada).
The following intelligent assistants are available:

Intelligent assistant

iDensityControl iProductionManager iCookingSuite iCareSystem

iDensityControl
iDensityControl is the iCombi Pro's intelligent climate management. The interaction among intelligent sensors, a high-performance heating system and fresh steam generator, and active dehumidification ensures that the right cooking cabinet climate is always available. Intelligent air circulation ensures the best possible energy input into the food. Consequently, this ensures extraordinary productivity while maintaining high levels of food quality, even cooking and minimum energy consumption.

iCookingSuite
The iCookingSuite is the iCombi Pro's cooking intelligence. The user starts by selecting the right cooking path for the food, choosing from among 6 operating modes and / or 5 cooking methods. Users also specify the desired cooking result. The unit suggests settings for browning and degree of doneness. Intelligent sensors detect the size, quantity and condition of the food. While the cooking path is in progress, the system adjusts key parameters like cooking cabinet temperature, airspeed, and cooking time accurately to the second. The selected desired results are achieved, yielding the best possible quality in the shortest possible time. It is possible to optionally influence the cooking sequence and adapt the cooking result. Users can change to iProductionManager or manual mode at any time. Thanks to iCookingSuite you can simply save time, raw materials, and energy while maintaining a standardized food quality without having to check the procedure.

iProductionManager
iProductionManager intelligently and flexibly organizes the production process. This includes which products can be prepared together on different trays, the ideal sequence of dishes, and monitoring the cooking sequence. iProductionManager supports users with prompts to load or unload dishes. Depending on kitchen processes you can freely position orders (up to two per level) or schedule them on the basis of a certain target time. iProductionManager arranges the sequence of dishes accordingly and automatically specifies the correct settings. Users decide whether dishes are cooked based on optimum energy consumption or a certain target time. Simple monitoring activities are no longer required, saving you working time and energy.

iCareSystem
The iCareSystem is the intelligent iCombi Pro cleaning and descaling system. It recommends the amount of chemicals and ideal cleaning stage from the nine available programs based on usage and any limescale in the steam generator. Ultra-fast interim cleaning cleans iCombi Pro in only 12 minutes, all cleaning programs can also run overnight without the need for supervision. The iCareSystem is particularly efficient and environmentally friendly, consuming small quantities of phosphate-free care products, water, and energy. This means that the iCombi Pro is always hygienically clean without manual work and at minimal costs.

Capacity
> Twenty (20) Full-size sheet pans or Fourty (40) Steam table pans or Twenty (20) 2/1 GN accessories
> Mobile oven rack with 2 1/2" inch rack spacing and tandem casters (63 mm)
> Handle holder for mobile rack
> Large selection of accessories for various cooking procedures, such as grilling, braising or baking
> For use with 2/1, 1/1, 2/4 GN accessories

Combi-steamer mode
> Steaming 86 °F - 266 °F
> Convection 86 °F – 572 °F
> Combination of steam and convection 86 °F – 572 °F

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Unit description and functions

Intelligent functions
> Intelligent climate management that measures, adjusts and controls the humidity down to the exact percentage
> The actual measured humidity in the cooking cabinet can be adjusted and viewed
> Dynamic air turbulence in the cooking cabinet thanks to three intelligent, reversible, high-performance fan wheels with five fan wheel speeds, intelligently actuated and manually programmable
> Intelligent cooking path regulation and automatic adjustment of cooking steps in order to achieve the target results, e.g., browning and degree of doneness, safely and efficiently - regardless of product size, load quantity, or who is using the unit
> Monitoring accurate to the second and calculation of browning on the basis of the Maillard reaction to reproduce ideal cooking results
> Adjust intelligent cooking methods or switch between iCookingSuite and iProductionManager for maximum flexibility
> Intelligent cooking step to proof baked goods
> Individual, intuitive programming of up to 1,200 cooking programs with up to 12 steps using drag-and-drop.
> Easy transfer of cooking programs to other cooking systems through secure cloud connection with ConnectedCooking or via USB stick
> iProductionManager, the automated, intelligent planning and controlling tool, organizes multiple cooking processes and mixed loads perfectly. Automatic closing of planning gaps. Automatic time or energy optimization in planning; target time preparation to start or end cooking dishes at the same time
> Automatically resumes and optimally completes cooking processes following power outages lasting less than 15 minutes
> Intelligent cleaning system suggests cleaning programs and the required amount of care products based on the degree of soiling within the cooking system
> Display of the current cleaning and descaling status

Cooking functions
> High-performance steam generator for optimal steaming performance even at low temperatures below 212°F
> Power-steam function: increased steaming power available for Asian applications
> Integrated, maintenance-free grease separation system without an additional grease filter
> Cool-down function to quickly cool down the cooking cabinet; additional fast cooling using internal water nozzle
> Core temperature probe with six measuring points and automatic error correction in the event of incorrect positioning. Optional positioning tool for soft or very small cooking products (accessory)
> Delta-T cooking for extremely gentle preparation with minimal cooking losses
> Precise burst-steam injection; water quantities can be set to 4 different levels within a temperature range of 85°F – 500°F for convection or steam-convection combination modes
> Digital temperature display, can be set to °C or °F, displays target and actual values
> Cooking cabinet humidity and time displayed digitally; displays target and actual values
> Time can be set to display in 12- or 24-hour format
> 24-hour real-time clock with automatic adjustment for daylight savings time when connected to ConnectedCooking
> Automatic pre-selected starting time with variable date and time
> Integrated hand shower with automatic retraction and switchable spray/jet function
> Energy-saving, long-lasting LED lighting in the cooking cabinet, with excellent color fidelity to allow quick determination of cooking progress
> No-charge 4-hour RATIONAL certified chef assistance program

Occupational and operating safety
> Electronic safety temperature limiter for steam generator and convection heating
> Integrated fan wheel brake
> Contact temperature of the cooking cabinet door max. 163 °F
> Use of Active Green cleaning tabs and Care tabs (solid cleaning agent) for ideal occupational safety levels
> HACCP data storage and output via USB or optional storage and management in the cloud-based networking solution ConnectedCooking
> Tested according to national and international standards for unsupervised operation
> Maximum tray height 63 inch when using RATIONAL mobile oven rack with 20 trays, 2 4/8 inch rack spacing (loss of USPHS certification)

Networking
> Integrated, IP-protected Ethernet interface for wired connection to the cloud-based ConnectedCooking networking solution
> Integrated Wi-Fi interface for wireless connection to the cloud-based networking solution ConnectedCooking
> Integrated USB interface for local data exchange
> Cloud-based ConnectedCooking solution allows central unit management; recipe, shopping cart and program management; HACCP data management; maintenance management

Cleaning and care
> Automatic, water pressure-independent cleaning and maintenance system for cooking cabinet and steam generator
> Nine cleaning programs for unsupervised cleaning, also overnight, with automatic cleaning and removal of limescale deposits within the steam generator
> Ultrafast cleaning in only 12 minutes for practically uninterrupted, hygienic production
> Automatic cleaning routine following power outages, ensuring that cooking cabinet remains free of cleaning agents even after the cleaning process has been canceled
> Phosphate- and phosphorus-free Active Green Cleaner and Care tabs. The tabs are also free of microplastic additives
> Triple glass pane cooking cabinet door with rear ventilation, thermally reflecting special coating and swiveling glass panes for easy cleaning
> Inside and outside material: stainless steel DIN 1.4301, seamless hygienic cooking cabinet with rounded corners and optimized air flow
> Glass and stainless steel surfaces allow easy, safe external cleaning; IPX5-class protection against spraying water in all directions
> Monitoring option for automatic cleaning using the cloud-based ConnectedCooking networking solution

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Operation

> High-resolution 10.1 inch TFT color display and capacitative touchscreen with self-explanatory icons for simple, intuitive operation with gestures like swiping and dragging
> Acoustic prompts and visual messages when user action is required
> Central dial with Push function for intuitive selection and confirmation of entries
> User interface and help function can be set to over 55 languages
> Basic national cuisine preferences can be selected regardless of language settings. Possible to select additional, local cuisine
> Specially adapted cooking parameters for international or country-specific dishes can be selected and started regardless of unit language settings
> Extensive search function including all cooking paths, application examples and settings
> Context-sensitive support that always shows the current help content for the displayed screen content
> Start application examples from help file
> Simple selection of cooking paths using six operating modes and/or five cooking methods
> Cockpit function to display information about the processes within a cooking path
> Customization and control of user profiles to prevent operator errors
> Interactive notifications regarding cooking paths, requested actions, intelligent functions and warnings thanks to Messenger

Installation, maintenance and environment

> Professional installation by RATIONAL-certified technicians recommended
> Rear in-direct floor drain with air gap is required, and should be supplied in alignment with local code.
> Adaptation to the installation site (height above sea level) through automatic calibration
> Operation without water softener and without additional manual descaling possible
> Flush-mounted installation *
> Service diagnostic system with automatic messages, self test function for actively testing cooking system functions
> Remote diagnosis via ConnectedCooking by certified RATIONAL service partners
> 2-year RATIONAL warranty including parts, labor, and travel**
> Regular maintenance is recommended. Servicing by RATIONAL service partner according to manufacturer recommendations

* See the installation or planner manual for details

** Terms and conditions apply, see manufacturer warranty statement at www.rational-online.com

Options

> MarineLine - marine version
> SecurityLine – prison / security version
> MobilityLine – mobile variant
> HeavyDutyLine – particularly heavy-duty version
> Integrated fat drain
> Protection for control panel
> Safety door lock
> Lockable control panel

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Technical specifications

Dimensions and weights

Dimensions (W x H x D)	
Cooking system (body)	42 5/8 x 71 1/8 x 41 3/8 inches
Cooking system (total)	42 3/5 x 73 3/4 x 44 inches
Cooking system with packaging	46 7/8 x 80 3/8 x 48 inches
Maximum working height of top level*	≤ 5 ft. 2 7/8 inches

* when using a RATIONAL mobile rack, Size 20-full size with 20 levels, level spacing 62 mm

Weights	
Maximum load size per level	66 lb
Maximum total load capacity	396 lb
Weight - electric unit without packaging	717 lb
Weight - electric unit with packaging	820 lb
Weight - gas unit without packaging	789 lb
Weight - gas unit with packaging	893 lb

Electrical connection conditions

Voltage 3 ph 208 V / 240 V	
Connected loads - electric	67.9 kW
Steam power	54 kW
Convection power	66 kW
Breaker	200 A
Connection impedance	0.09 Ω
Running AMPS	188.5 A (208 V) / 163.3 A (240 V)
Cable diameter	AWG 3/0 194°F
Voltage 3 ph 440 V / 480 V	
Connected loads - electric	67.9 kW
Steam power	54 kW
Convection power	66 kW
Breaker	100 A
Connection impedance	0.09 Ω
Running AMPS	89.1 A (440 V) / 81.7 A (480 V)
Cable diameter	AWG 2 194°F

Not supplied with cable connection

Connected loads - gas

Natural gas G20	
Nominal heat load, total	303500 BTU
Nominal heat load, Steam mode	193500 BTU
Nominal heat load, Hot Air mode	303500 BTU
Required connection flow pressure	6.5 – 10 inch w.c.
Liquid gas	
Nominal heat load, total	296500 BTU
Nominal heat load, Steam mode	189000 BTU
Nominal heat load, Hot Air mode	296500 BTU
Required connection flow pressure	10 – 15 inch w.c.

1" female NPT gas shut-off valve
Additional gas types and voltages available on request

Connected loads - gas

Voltage 1 ph 208 V	
Connected loads - gas	2.2 kW
Breaker	15 A
Running AMPS	10.6 A

All gas units are supplied with a 6 ft cord.

Connection conditions water

Connection	3/4" GHT
Supply minimum	1/2" ID Drinking Quality Cold
Water pressure (flow pressure), each	14.5-87.0 psi
Maximum flow rate per cooking system	3 gal/min
Water drain, each	2" OD
Max short-term amount of wastewater	0.11 gal/sec

Use only high-temperature resistant drain pipe

Water quality requirements

Untreated water can be 0 to 24.5 gr/gal (0 to 420ppm) hardness. We do not recommend treated water hardness < 5 gr/gal (86ppm) because the water could be corrosive. Sodium ion exchangers are not recommended; H+ Ion exchange systems are recommended. Water that does not meet the following minimum standards will require the proper conditioning

Contaminant	Water Requirements	If > than recommended
Sand / Particles	< 15 µm	Particle filter
Chlorine (Cl2)	< 0.012 gr/gal (0.2 ppm)	Active carbon filter
Chloride (Cl-)	< 4.68 gr/gal (80 ppm)	RO

All RATIONAL iCombi Pro & Classic models meet the requirements for LEED, IGCC and any local codes that have adopted them, based on water consumption and efficiency.

Model	XS	6 half size	6 full size	10 half size	10 full size	20 half size	20 full size
gal/hr	0.9	1.8	3.5	3.3	5.9	6.4	9.2
gal/hr/pan	0.3	0.3	0.3	0.3	0.3	0.3	0.2

Connected loads - exhaust air and thermal load

Latent heat load	10331 BTU
Sensible heat emission	13667 BTU
Sound level (electric)	60 dBA
Sound level (gas)	65 dBA

Connection loads - data

LAN data interface	RJ45
WiFi data interface	IEEE 802.11 a/g/n

Minimum distances at installation

Clearance Requirements
To facilitate servicing, we recommend leaving a 20" (500 mm) gap on the left-hand side of the unit. If there is not 20" (500 mm) left side clearance available, provisions for moving the unit to the left for service access must be made. Such provisions include, but are not limited to, having quick connections (water, gas, etc.) and lengthened electrical connections with flexible cords.
If there are no external heat sources acting on the unit, there should be at least 2" (50 mm) of clearance on either side of the unit. On the back, single units and electric Combi-Duo vent pipe can be mounted flush with the wall. 2" rear clearance from the gas Combi-Duo exhaust gas box.
If a high temperature heat source is on the left or right side of the unit, clearance of at least 14" (350 mm) must be maintained on the respective side. This clearance may be reduced to 2" (50 mm) if a heat shield is used (see accessories).
Recommended clearance from unobstructed rear exhaust pipes and any surface collecting grease or flammable material; 16" (400 mm) gas, 10" (254 mm) electric. It is recommended to have a hood overhang of 6" (150

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mm) to 18" (450 mm) at the front of the unit and 6" (150 mm) on the sides if installed at the end of the cooking line. Please refer to the Installation Manual for additional technical data and for instructions on installation and setup.

Installation conditions

- Observe all local and country-specific standards and regulations regarding the installation and operation of commercial cooking appliances. The local standards and regulations for interior ventilation systems must also be taken into account.
- To use ConnectedCooking, an RJ45 network socket or a WLAN connection option (IEEE 802.11 a/g/n) must be in place on-site. For optimal performance, a data rate of at least 100 MB/s is required.
- Do not connect to any receptacle that local code requires protection by a UL 943 listed Class A GFCI. The device is approved for field hardwiring per local code.

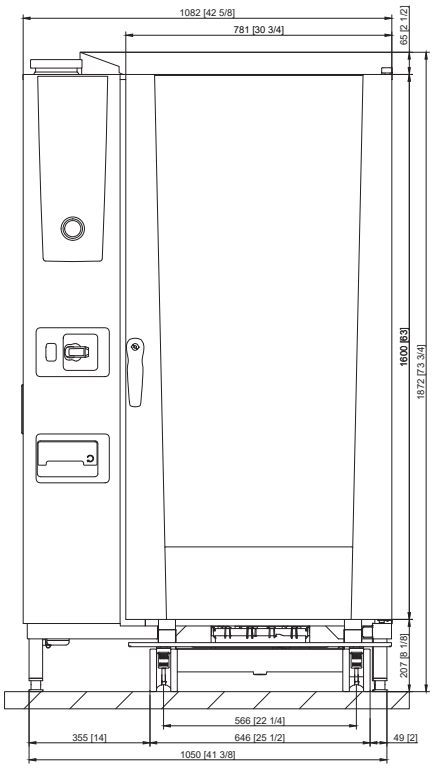
Approvals

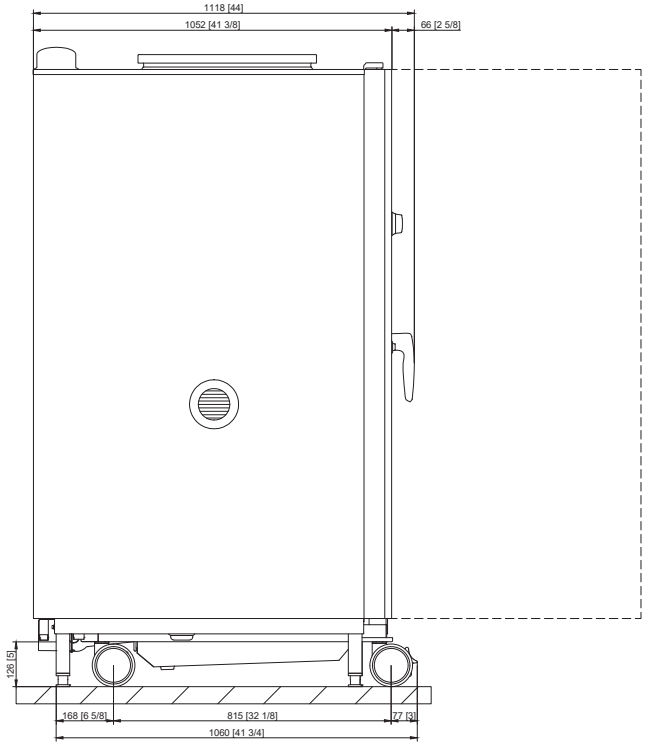
NSF Certification

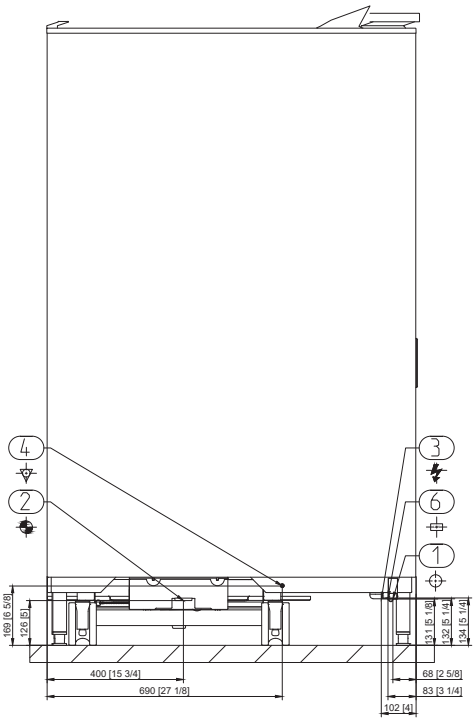
iCombi Pro (LM100) and iCombi Classic (LM200) are NSF-certified, shown on the NSF list.

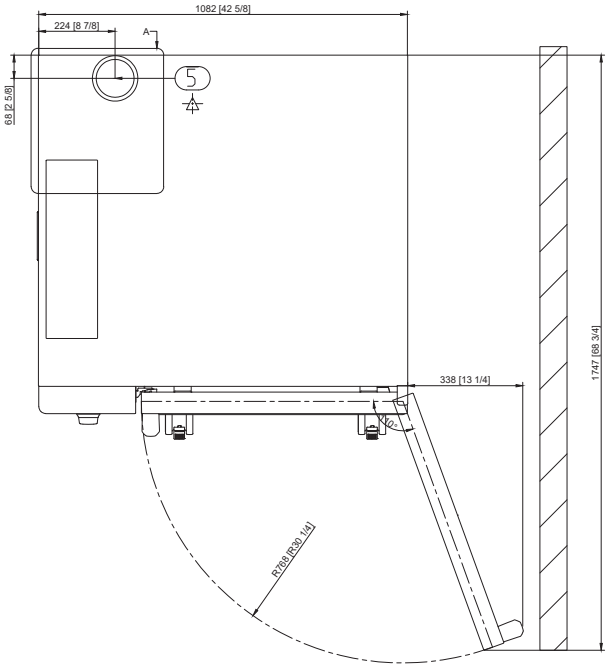
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Technical drawing, electrical









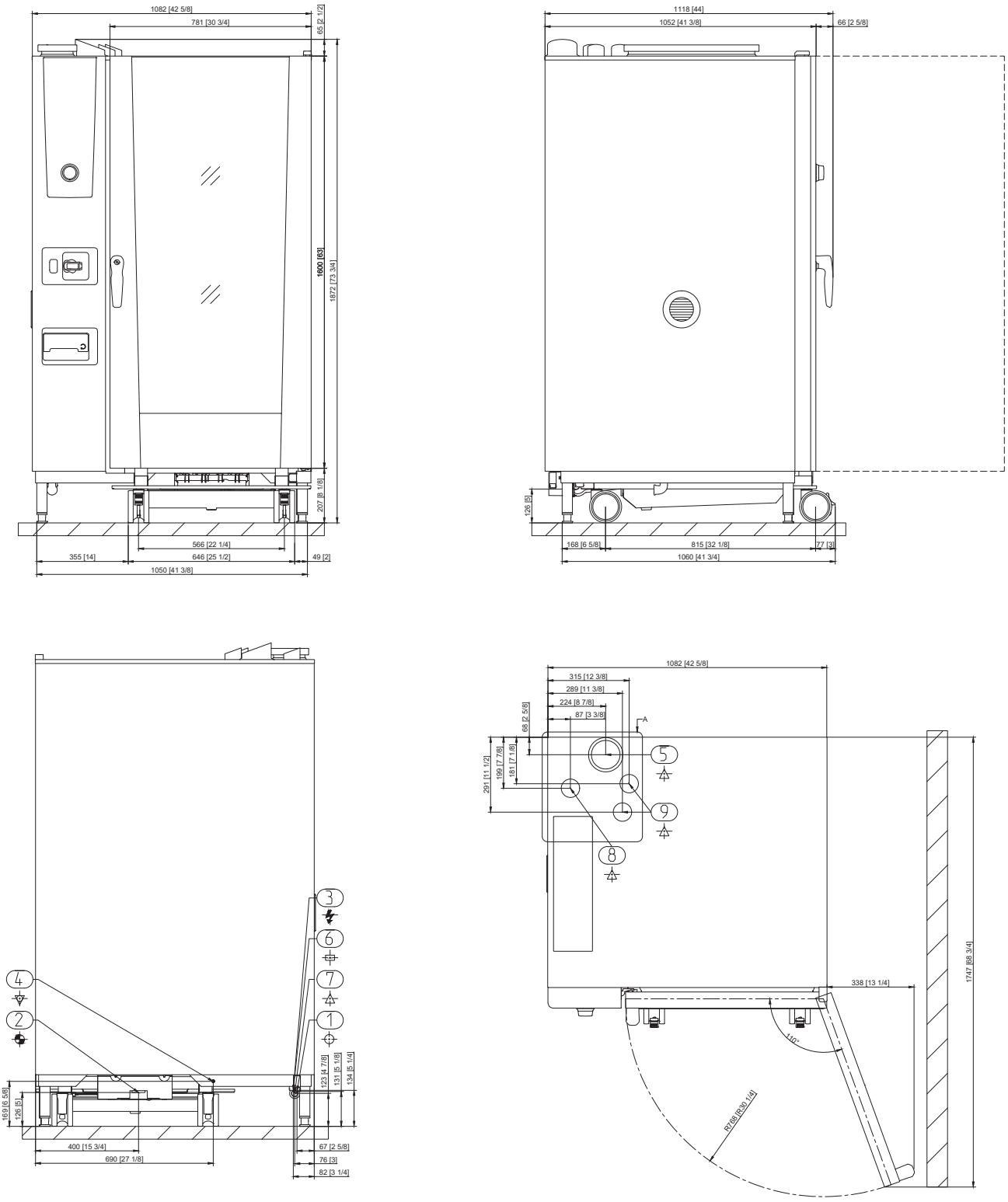
1	Water inlet
2	Water drain
3	Electrical connection
4	Equipotential bonding
5	Ventilation pipe

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6	Ethernet interface

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Technical drawing, gas



1	Water inlet
2	Water drain
3	Electrical connection
4	Equipotential bonding
5	Ventilation pipe

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6	Ethernet interface
7	Gas connection
8	Exhaust pipe gas (steam)
9	Exhaust pipe gas (convection)

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Accessories

> 10 full size stainless steel grids included with delivery of the cooking system

Accessories	Item number
RATIONAL Active Green cleaning agent tabs – guarantee the best cleaning performance	Item no. 56.01.535
RATIONAL Care tabs – effectively prevent limescale deposits	Item no. 56.00.562
Condensation breaker – diverts steam and vapors to an existing exhaust air system Sizes 20-half size and 20-full size	Item no. 60.75.326
RATIONAL USB stick – to securely transfer cooking programs and HACCP data	Item no. 42.00.162
Ramp - evens out inclines (up to 3%) allowing mobile rack to be rolled in smoothly Size 20-full size	Item no. 60.22.380
Full size sheet pan adapter	Item no. Top 60.22.392 Item no. Below 60.22.393
Heat shield – for installing a unit near a heat source, e.g. a grill - Size 20-full size	Item no. 60.75.826
Mobile catering stand - especially for heavy mobile catering usage	Item no. 60.22.496
Mobile oven rack and mobile plate oven rack – for simple loading outside the cooking system	See Cooking Systems and Accessories catalog
RATIONAL Double Water Filter - for Combi Duo 6-full size/6-full size and 6-full size/10-full size or if used for more than 2 units	Item no. 1900.1150US

We offer a wide range of cooking accessories to help you achieve ideal cooking results; for more information, please consult our accessories brochure, ask your dealer, or visit www.rational-online.com

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Planner	RATIONAL USA Inc.
	1701 Golf Road, Suite C-120, Commercium Rolling Meadows, IL 60008 Toll Free: 888-320-7274 Fax: 847-755-9583 Email: info@rational-online.com Visit us on the internet: www.rational-online.com

11 40 01-218

Submittal Sheet

09/15/2026

ITEM# 2.20 - HAND SINK (1 EA REQ'D)

Advance Tabco 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

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STAINLESS STEEL

HAND SINKS

with SOAP and PAPER TOWEL DISPENSER

Conforms To NSF 61/9 Lead Free Requirements

11 40 01-219

Item #: _____ **Qty #:** _____

Model #: _____

Project #: _____

TOUCHLESS SOAP DISPENSER



7-PS-131



7-PS-79



7-PS-80

Includes Side supports



7-PS-69



7-PS-85

Includes Skirt

FRONT LOAD TOWEL DISPENSER HAND SINKS

7-PS-41



A.D.A. Compliant

Electronic Faucet



7-PS-46

CLICK HERE TO VIEW SPEC SHEET

FEATURES:
One piece **Deep Drawn** sink bowl design.
"Z" bracket wall mounting plate
Keyhole wall mount bracket.
C-fold style towel dispenser with hinged towel box.

Specific Unit Features:

7-PS-69:
10" x 14" x 5" sink bowl.
Splash mount liquid soap dispenser.
K-69 heavy duty splash mount faucet (with wrist handles)
Side support brackets.
Lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-79:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.

7-PS-80:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser
Includes lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-85
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Chrome plated 1 1/2" p-trap & apron.

7-PS-131:
10" x 14" x 5" sink bowl.
K-175 electronic faucet.
Splash mount touchless liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.
7-3/4" Side Splashes.

CONSTRUCTION:
All TIG welded.
All sink bowls have a large liberal radii with a minimum dimension of 2" and are rectangular in design.
Welded areas blended to match adjacent surfaces and to a satin finish.
Die formed countertop edge with a no-drip offset.

MATERIAL:
Heavy gauge type 304 series stainless steel.
Galvanized wall bracket.
All fittings are brass / chrome plated unless otherwise indicated.

MECHANICAL:
Faucet supply is 1/2" ips male thread hot and cold.

Faucet Flow Rate:
1.0 GPM/3.8 LPM aerator. 60 PSI.
7-PS-131 - 2.2 GPM/8.328 LPM aerator. 60 PSI.

HANDS-FREE TOUCHLESS SOAP DISPENSER UPGRADE



7-PS-104

- Wall Mounted
- A/C or Battery Powered (Requires 4 "AA" Batteries. Not Included)
- Low Soap Indicator Window
- Includes Wall Bracket & Hardware
- Uses Liquid Soap

(Excludes 7-PS-131)

CLICK HERE TO VIEW SPEC SHEET

⚠ **WARNING:** Equipment that includes a faucet may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info., visit www.p65warnings.ca.gov.

ADVANCE TABCO
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

For Orders & Customer Service:
Email: customer@advancetabco.com or Fax: 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or Fax: 631-586-2933

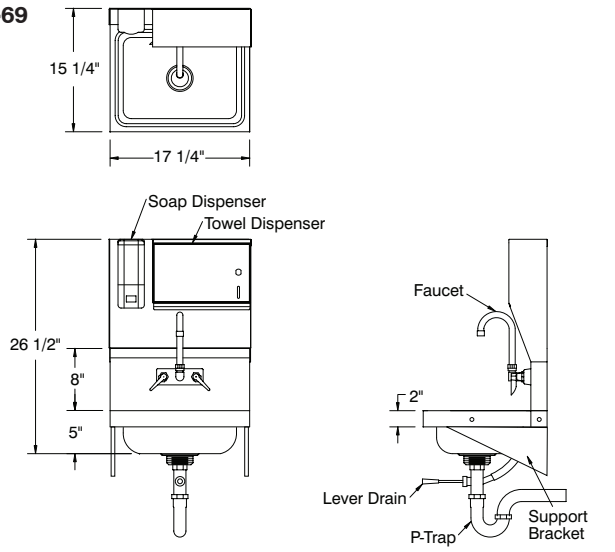
REF-B

DIMENSIONS and SPECIFICATIONS

11 40 01-220

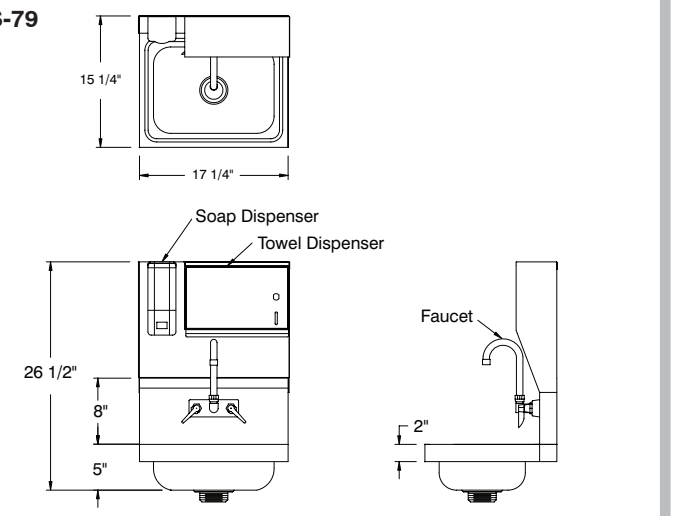
TOL Overall: ± .500" Interior: ± .250" **FITTINGS SUPPLIED AS SHOWN** **ALL DIMENSIONS ARE TYPICAL**

7-PS-69



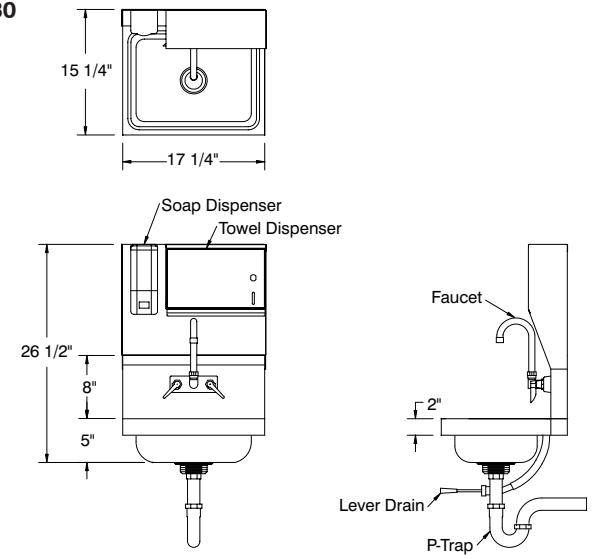
35 lbs.

7-PS-79



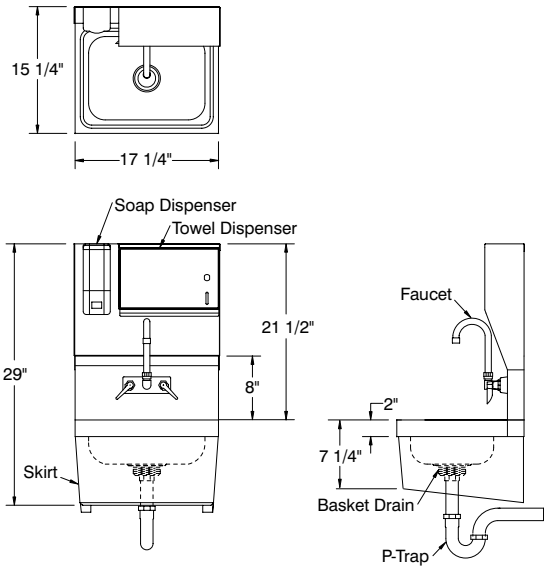
32 lbs.

7-PS-80



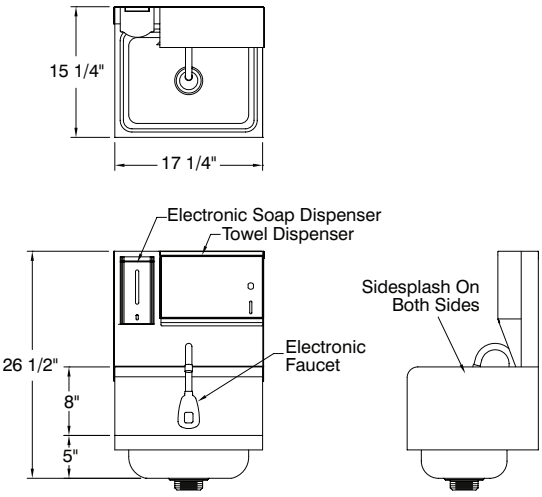
32 lbs.

7-PS-85



35 lbs.

7-PS-131



30 lbs.

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ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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23141 SUNY Faye Corey Student Union

11 40 01-221

Submittal Sheet

09/15/2026

ITEM# 2.21 - FIRE SUPPRESSION SYSTEM (COST INCL IN 2.12L) (1 EA REQ'D)

Halton ANSUL R-102 WET CHEMICAL

Wet Chemical System
Stainless steel enclosure with cover for agent tank, release and regulator mechanisms
Location: Wall mounted
Pre-engineered system lines and nozzles to be factory installed by manufacturer of Item(s) 2.12L/M/R
All exposed piping and fittings to be stainless steel or chrome-plated including piping over the cooking equipment
System to serve Item(s): 2.13, 2.15, 2.16, 2.17 and 2.19
Manual remote fire pulls located per Code
Electric gas line shut-off valve and pressure switch to shut off electrical power to equipment

11 40 01-222

ANSUL
by Tyco Fire Suppression & Building Products

R-102™ RESTAURANT FIRE SUPPRESSION SYSTEMS

Data/Specifications

FEATURES

- Low pH Agent
- Proven Design
- Reliable Gas Cartridge Operation
- Aesthetically Appealing
- UL Listed – Meets Requirements of UL 300
- ULC Listed – Meets Requirements of ULC/ORD-C1254.6
- CE Marked

APPLICATION

The ANSUL® R-102™ Restaurant Fire Suppression System is an automatic, pre-engineered, fire suppression system designed to protect areas associated with ventilating equipment including hoods, ducts, plenums, and filters. The system also protects auxiliary grease extraction equipment and cooking equipment such as fryers; griddles and range tops; upright, natural charcoal, or chain-type broilers; electric, lava rock, mesquite, or gas-radiant char-broilers; and woks.

The system is ideally suitable for use in restaurants, hospitals, nursing homes, hotels, schools, airports, and other similar facilities.

Use of the R-102 system is limited to indoor applications or locations that provide weatherproof protection within tested temperature limitations. The regulated release and tank assemblies must be mounted in an area where the air temperature will not fall below 32 °F (0 °C) or exceed 130 °F (54 °C). The system must be designed and installed within the guidelines of the UL/ULC Listed Design, Installation, Recharge, and Maintenance Manual.

SYSTEM DESCRIPTION

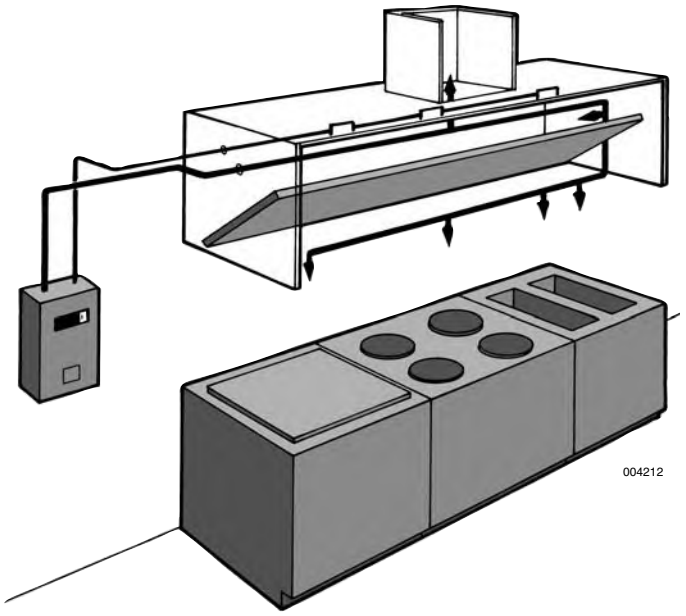
The restaurant fire suppression system is a pre-engineered, wet chemical, cartridge-operated, regulated pressure type with a fixed nozzle agent distribution network. It is listed with Underwriters Laboratories, Inc. (UL/ULC).



004215

The system is capable of automatic detection and actuation as well as remote manual actuation. Additional equipment is available for building fire alarm panel connections, electrical shutdown and/or interface, and mechanical or electrical gas line shut-off applications.

The detection portion of the fire suppression system allows for automatic detection by means of specific temperature-rated alloy type fusible links, which separate when the temperature exceeds the rating of the link, allowing the regulated release to actuate.



004212

A system owner's guide is available containing basic information pertaining to system operation and maintenance. A detailed technical manual, including system description, design, installation, recharge and resetting instructions, and maintenance procedures, is available to qualified individuals.

The system is installed and serviced by authorized distributors that are trained by the manufacturer.

The basic system consists of an ANSUL AUTOMAN® regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. Nozzles with blow-off caps, detectors, cartridges, agent, fusible links, and pulley elbows are supplied in separate packages in the quantities needed for fire suppression system arrangements.

Additional equipment includes a remote manual pull station(s), mechanical and electrical gas valves, and electrical switches for automatic equipment and gas line shut-off. Accessories can be added such as alarms, warning lights, etc., to installations where required.

Additional tanks and corresponding equipment can be used in multiple arrangements to allow for larger hazard coverage. Each tank is limited to a listed maximum amount of flow numbers.

11 40 01-223



COMPONENT DESCRIPTION

Wet Chemical Agent – The extinguishing agent is a mixture of organic salts designed for rapid flame knockdown and foam securement of grease related fires. It is available in plastic containers with instructions for wet chemical handling and usage.

Agent Tank – The agent tank is installed in a stainless steel enclosure or wall bracket. The tank is constructed of stainless steel.

Tanks are available in two sizes: 1.5 gallon (5.7 L) and 3.0 gallon (11.4 L). The tanks have a working pressure of 110 psi (7.6 bar), a test pressure of 330 psi (22.8 bar), and a minimum burst pressure of 660 psi (45.5 bar).

The tank includes an adaptor/tube assembly. The adaptor assembly includes a chrome-plated steel adaptor with a 1/4 in. NPT female gas inlet, a 3/8 in. NPT female agent outlet, and a stainless steel agent pick-up tube. The adaptor also contains a bursting disc seal which helps to prevent the siphoning of agent up the pipe during extreme temperature variations.

Regulated Release Mechanism – The regulated release mechanism is a spring-loaded, mechanical/pneumatic type capable of providing the expellant gas supply to one, two, or three agent tanks depending on the capacity of the gas cartridge used. It contains a factory installed regulator deadset at 110 psi (7.6 bar) with an external relief of approximately 180 psi (12.4 bar). It has automatic actuation capabilities by a fusible link detection system and remote manual actuation by a mechanical pull station.

The regulated release mechanism contains a release assembly, regulator, expellant gas hose, and agent storage tank housed in a stainless steel enclosure with cover. The enclosure contains knock-outs for 1/2 in. conduit. The cover contains an opening for a visual status indicator.

It is compatible with mechanical gas shut-off devices; or, when equipped with a field or factory-installed switch and manual reset relay, it is compatible with electric gas line or appliance shut-off devices.

Regulated Actuator Assembly – When more than two agent tanks (or three 3.0 gallon (11.4 L) tanks in certain applications) are required, the regulated actuator is available to provide expellant gas for additional tanks. It is connected to the cartridge receiver outlet of the regulated release mechanism providing simultaneous agent discharge. It contains a regulated actuator deadset at 110 psi (7.6 bar) with an external relief of approximately 180 psi (12.4 bar). It has automatic actuation capabilities using pressure from the regulated release mechanism cartridge.

The regulated actuator assembly contains an actuator, regulator, expellant gas hose, and agent tank housed in a stainless steel enclosure with cover. The enclosure contains knockouts to permit installation of the expellant gas line.

Discharge Nozzles – Each discharge nozzle is tested and listed with the R-102 system for a specific application. Nozzle tips are stamped with the flow number designation (1/2, 1, 2, or 3). Each nozzle must have a metal or rubber blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.

Agent Distribution Hose – Kitchen appliances manufactured with or resting on casters (wheels/rollers) may include an agent distribution hose as a component of the suppression system. This allows the appliance to be moved for cleaning purposes without disconnecting the appliance fire suppression protection. The hose assembly includes a restraining cable kit to limit the appliance movement within the range (length) of the flexible hose.

Flexible Conduit – Flexible conduit allows for quicker installations and the convenience of being able to route the cable over, under and around obstacles. Flexible conduit can be used as a substitute for standard EMT conduit or can be used with EMT conduit.

Flexible conduit can be used only with the Molded Remote Manual Pull Station.

Pull Station Assembly – The remote manual pull station is made out of a molded red composite material. The red color makes the pull station more readily identifiable as the manual means for fire suppression system operation.

The pull station is compatible with the ANSUL Flexible Conduit.

APPROVALS

- UL/ULC Listed
- CE Marked
- New York City Department of Buildings
- LPCB
- TFRI
- Marine Equipment Directive (MED)
- DNV
- ABS
- Lloyd's Register
- Meets requirements of NFPA 96 (Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment)
- Meets requirements of NFPA 17A (Standard on Wet Chemical Extinguishing Systems)

ORDERING INFORMATION

Order all system components through your local authorized ANSUL Distributor.

SPECIFICATIONS

11 40 01-224

An ANSUL R-102 Fire Suppression System shall be furnished. The system shall be capable of protecting all hazard areas associated with cooking equipment.

1.0 GENERAL

1.1 References

1.1.1 Underwriters Laboratories, Inc. (UL)
1.1.1.1 UL Standard 1254
1.1.1.2 UL Standard 300

1.1.2 Underwriters Laboratories of Canada (ULC)
1.1.2.1 ULC/ORD-C 1254.6

1.1.3 National Fire Protection Association (NFPA)
1.1.3.1 NFPA 96
1.1.3.2 NFPA 17A

1.2 Submittals

1.2.1 Submit two sets of manufacturer's data sheets

1.2.2 Submit two sets of piping design drawings

1.3 System Description

1.3.1 The system shall be an automatic fire suppression system using a wet chemical agent for cooking grease related fires.

1.3.2 The system shall be capable of suppressing fires in the areas associated with ventilating equipment including hoods, ducts, plenums, and filters as well as auxiliary grease extraction equipment. The system shall also be capable of suppressing fires in areas associated with cooking equipment, such as fryers; griddles and range tops; upright, natural charcoal, or chain-type broilers; electric, lava rock, mesquite or gas-radiant char-broilers; and woks.

1.3.3 The system shall be the pre-engineered type having minimum and maximum guidelines established by the manufacturer and listed by Underwriters Laboratories (UL/ULC).

1.3.4 The system shall be installed and serviced by personnel trained by the manufacturer.

1.3.5 The system shall be capable of protecting cooking appliances by utilizing either dedicated appliance protection and/or overlapping appliance protection.

1.4 Quality Control

1.4.1 Manufacturer: The R-102 Restaurant Fire Suppression System shall be manufactured by a company with at least forty years experience in the design and manufacture of pre-engineered fire suppression systems. The manufacturer shall be ISO 9001 registered.

1.4.2 Certificates: The wet agent shall be a specially formulated, aqueous solution of organic salts with a pH range between 7.7 – 8.7, designed for flame knockdown and foam securement of grease-related fires.

1.5 Warranty, Disclaimer, and Limitations

1.5.1 The pre-engineered restaurant fire suppression system components shall be warranted for five years from date of delivery against defects in workmanship and material.

1.6 Delivery

1.6.1 Packaging: All system components shall be securely packaged to provide protection during shipment.

1.7 Environmental Conditions

1.7.1 The R-102 system shall be capable of operating within a temperature range of 32 °F to 130 °F (0 °C to 54 °C).

2.0 PRODUCT

2.1 Manufacturer

2.1.1 Tyco Fire Suppression & Building Products, One Stanton Street, Marinette, Wisconsin 54143-2542, Telephone (715) 735-7411.

2.2 Components

2.2.1 The basic system shall consist of an ANSUL AUTOMAN regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. Nozzles, blow-off caps, detectors, cartridges, agent, fusible links, and pulley elbows shall be supplied in separate packages in the quantities needed for fire suppression system arrangements. Additional equipment shall include remote manual pull station, mechanical and electrical gas valves, and electrical switches for automatic equipment and gas line shut-off, and building fire alarm control panel interface.

2.2.2 Wet Chemical Agent: The extinguishing agent shall be a specially formulated, aqueous solution of organic salts with a pH range between 7.7 – 8.7, designed for flame knockdown and foam securement of grease related fires.

2.2.3 Agent Tank: The agent tank shall be installed in a stainless steel enclosure or wall bracket. The tank shall be constructed of stainless steel. Tanks shall be available in two sizes; 1.5 gallon (5.7 L) and 3.0 gallon (11.4 L).The tank shall have a working pressure of 110 psi (7.6 bar), a test pressure of 330 psi (22.8 bar), and a minimum burst pressure of 660 psi (45.5 bar). The tank shall include an adaptor/tube assembly containing a burst disc union.

2.2.4 Regulated Release Mechanism: The regulated release mechanism shall be a spring-loaded, mechanical/pneumatic type capable of providing the expellant gas supply to one or two agent tanks depending on the capacity of the gas cartridge used or three 3.0 gallon (11.4 L) agent storage tanks in certain applications. It shall contain a factory installed regulator deadset at 110 psi (7.6 bar) with an external relief of approximately 180 psi (12.4 bar).

It shall have the following actuation capabilities: automatic actuation by a fusible link detection system and remote manual actuation by a mechanical pull station.

The regulated release mechanism shall contain a release assembly, regulator, expellant gas hose, and agent storage tank housed in a stainless steel enclosure with cover. The enclosure shall contain knockouts for 1/2 in. conduit. The cover shall contain an opening for a visual status indicator.

It shall be compatible with mechanical gas shut-off devices; or, when equipped with a field or factory-installed switch(es), it shall be compatible with electric gas line or appliance shut-off devices, or connections to a building fire alarm control panel.

2.2.5 Regulated Actuator Assembly: When more than two agent tanks or three agent tanks in certain applications are required, the regulated actuator shall be available to provide expellant gas for additional tanks. It shall be connected to the cartridge receiver outlet of the regulated release mechanism providing simultaneous agent discharge. The regulator shall be deadset at 110 psi (7.6 bar) with an external relief of approximately 180 psi (12.4 bar).The regulated actuator assembly shall contain an actuator, regulator, expellant gas hose, and agent tank housed in a stainless steel enclosure with cover. The enclosure shall contain knockouts to permit installation of the expellant gas line.

2.2.6 Discharge Nozzles: Each discharge nozzle shall be tested and listed with the R-102 system for a specific application. Nozzles tips shall be stamped with the flow number designation (1/2, 1, 2, or 3). Each nozzle shall have a metal or rubber blow-off cap to keep the nozzle tip orifice free of cooking grease build-up.

SPECIFICATIONS

11 40 01-225

2.0 PRODUCT (Continued)

2.2 Components (Continued)

2.2.7 Distribution Piping: Distribution piping shall be Schedule 40 black iron, chrome-plated, or stainless steel conforming to ASTM A120, A53, or A106.

2.2.8 Detectors: The detectors shall be the fusible link style designed to separate at a specific temperature.

2.2.9 Cartridges: The cartridge shall be a sealed steel pressure vessel containing either carbon dioxide or nitrogen gas. The cartridge seal shall be designed to be punctured by the releasing device supplying the required pressure to expel wet chemical agent from the storage tank.

2.2.10 Agent Distribution Hose: An optional agent distribution hose shall be available for kitchen appliances manufactured with or resting on casters (wheels/rollers). This shall allow the appliance to be moved for cleaning purposes without disconnecting the appliance fire suppression protection. Hose assembly shall include a restraining cable kit to limit the appliance movement within the range (length) of the flexible hose.

2.2.11 Flexible Conduit: The manufacturer supplying the Restaurant Fire Suppression System shall offer flexible conduit as an option to rigid EMT conduit for the installation of pull stations and/or mechanical gas valves. The flexible conduit shall be UL Listed and include all approved components for proper installation.

2.2.12 Pull Station Assembly: The Fire Suppression System shall include a remote pull station for manual system actuation. The pull station shall be designed to include a built-in guard to protect the pull handle. The pull station shall also be designed with a pull handle to allow for three finger operation and shall be red in color for quick visibility.

3.0 IMPLEMENTATION

3.1 Installation

3.1.1 The R-102 fire suppression system shall be designed, installed, inspected, maintained, and recharged in accordance with the manufacturer's listed instruction manual.

3.2 Training

3.2.1 Training shall be conducted by representatives of the manufacturer.

▸ Indicates revised information

ANSUL, ANSUL AUTOMAN, and R-102 are trademarks of Tyco Fire Suppression & Building Products or its affiliates.

11 40 01-226

Submittal Sheet

09/15/2026

ITEM# 2.22 - HOT HOLDING CABINET, PASS THROUGH (2 EA REQ'D)

Hatco FSHC-12W2

Flav-R-Savor® Humidified Holding Cabinet, (2) Lexan® doors, Pass-thru, (12 pair) universal slides 3" OC adjustable on 1-1/2" OC, stainless steel construction, 5" swivel casters (two swivel with wheels locks, two rigid), NSF, cULus, Made in USA

ACCESSORIES

Mfr	Qty	Model	Spec
Hatco	2		Standard Cord location: facing controls, right hand side panel, lower right corner

11 40 01-227

Project _____

Item # _____

Quantity _____

Flav-R-Savor® Tall Humidified Holding Cabinets

Models: FSHC-12W1, -12W2,
FSHC-17W1, -17W1D, -17W2 -17W2D

The Hatco Flav-R-Savor® Tall Humidified Holding Cabinets are capable of holding a great variety of hot food items at optimum serving temperatures. Thermostatically-controlled heat and humidity safely keeps food at uniform temperatures and ideal environment. Foods stay fresh longer with less waste, and an all stainless steel construction gives optimal strength and support.



Model FSHC-17W1 with accessory food pans



Model FSHC-12W1 with accessory food pans

Standard features

- Models are available with a solid back or a pass-through design, with a full view Lexan® door full perimeter gasket and 5" (127 mm) casters (two swivel with wheel locks and two rigid)
- Electronic controls with digital read out temperature range of 80°-200°F (27°-93°C), while the lower temperatures will accommodate proofing
- Fully insulated doors, sidewalls, top, bottom, and control panel assist in retaining heat
- Right- or left-hand hinged doors with magnetic latch and heavy-duty plated hinges can be reversed in the field.
- FSHC-12W models have 12-sheet pan capacity on 3" (76 mm) centers, adjustable on 1.5" (38 mm) centers, with 12 universal pan slides, designed to accommodate up to 12 sheet pans, or up to 24 steam table pans
- FSHC-17W models have 17-sheet pan capacity on 3" (76 mm) centers, adjustable on 1.5" (38 mm) centers, with 17 universal pan slides designed to accommodate up to 17 sheet pans, or up to 34 steam table pans
- Models shipped with 10' cord and plug, 5" (127 mm) casters, and universal slides

Options (available at time of purchase only)

- ☐ Deluxe Package (Includes flush mount handles and full perimeter bumper)
- ☐ Transport Package (Includes stand-off handles, full perimeter bumper, heavy-duty 5" x 2" [127 x 51 mm] casters [two swivel with wheel locks and two rigid], and flush mount transport latch)
- ☐ Cord Wind (for transport package only)
- ☐ Stainless Steel Door (In lieu of Lexan® door)
- ☐ Stainless Steel Dutch Doors (In lieu of Lexan® Dutch doors) (FSHC-17W models only)

Accessories

- ☐ Extra Pan Slides
- ☐ Food Pans

WATER QUALITY REQUIREMENTS
Water supply in excess of 3.0 grains of hardness per gallon (GPG) (.75 grains of hardness per liter) must be treated and softened before being used. Water containing over 3.0 GPG (.75 GPL) will decrease the efficiency and reduce the operating life of the unit.
Note: Product failure caused by liming or sediment buildup is not covered under warranty.

For operation, location and safety information, please refer to the Installation and Operating Manual.

MADE IN THE USA

HATCO CORPORATION | P.O. Box 340500 Milwaukee, WI 53234-0500 U.S.A. | (800) 558-0607 | (414) 671-6350
www.hatcocorp.com | support@hatcocorp.com | Find a Hatco Rep | Image Library | Document Library | Patents | Chat

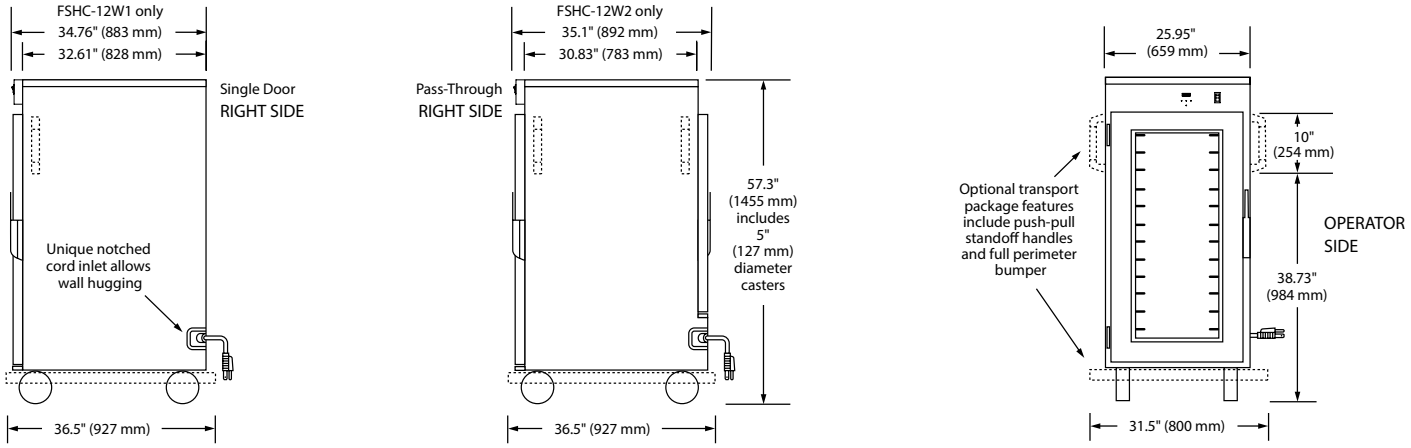
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11 40 01-228

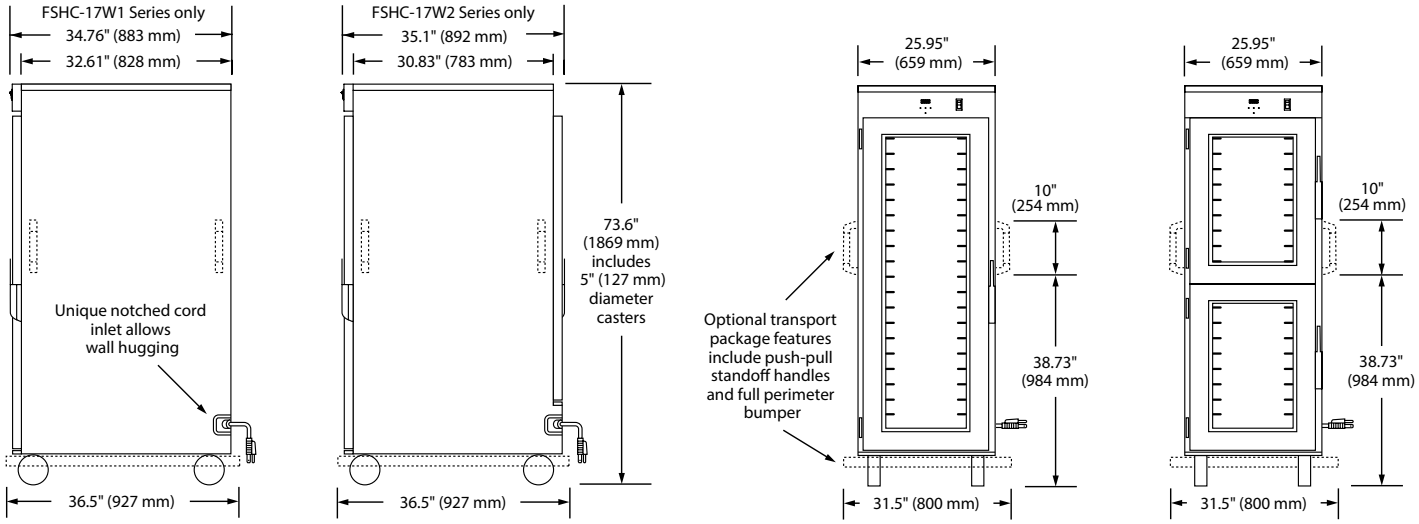
Flav-R-Savor® Tall Humidified Holding Cabinets

Models: FSHC-12W1, -12W2, -17W1, -17W1D, -17W2, -17W2D

FSHC-12W Series



FSHC-17W Series

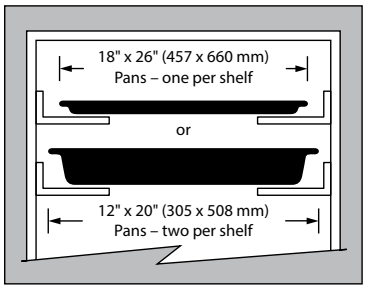


Single Door
RIGHT SIDE

Pass-Through
RIGHT SIDE

Single Door
OPERATOR SIDE

Single Opening
w/ 2 Dutch Doors
OPERATOR SIDE



Pan Capacity

FSHC-12W: 12-sheet pan capacity on 3" (76 mm) centers, adjustable on 1.5" (38 mm) centers, with universal slides designed to accommodate up to 12 sheet pans, or up to 24 steam table pans.

FSHC-17W: 17-sheet pan capacity on 3" (76 mm) centers, adjustable on 1.5" (38 mm) centers, with universal slides designed to accommodate up to 17 sheet pans, or up to 34 steam table pans.

11 40 01-229

Flav-R-Savor® Tall Humidified Holding Cabinets

Models: FSHC-12W1, -12W2, -17W1, -17W1D, -17W2, -17W2D

SPECIFICATIONS
Flav-R-Savor® Portable Holding Cabinets

The shaded areas contain electrical information for International models

Model	Description	Dimensions (W x D x H) w/Casters	Volts	Hertz	Watts	Amps	Plug	Ship Weight*
FSHC-12W1	Single Lexan® Door	25.95"W x 34.76"D x 57.3"H (659 x 883 x 1455 mm)	120	60	1650	13.8	NEMA 5-15P▲	303 lbs. (138 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	303 lbs. (138 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	303 lbs. (138 kg)
FSHC-12W2	2 Lexan® Doors Pass-through	25.95"W x 35.1"D x 57.3"H (659 x 892 x 1455 mm)	120	60	1650	13.8	NEMA 5-15P▲	316 lbs. (143 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	316 lbs. (143 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	316 lbs. (143 kg)
FSHC-17W1	Single Lexan® Door	25.95"W x 34.76"D x 73.6"H (659 x 883 x 1869 mm)	120	60	1650	13.8	NEMA 5-15P▲	352 lbs. (160 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	352 lbs. (160 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	352 lbs. (160 kg)
FSHC-17W1D	Single Opening w/ 2 Dutch Doors	25.95"W x 34.76"D x 73.6"H (659 x 883 x 1869 mm)	120	60	1650	13.8	NEMA 5-15P▲	340 lbs. (154 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	340 lbs. (154 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	340 lbs. (154 kg)
FSHC-17W2	2 Lexan® Doors Pass-Through	25.95"W x 35.1"D x 73.6"H (659 x 892 x 1869 mm)	120	60	1650	13.8	NEMA 5-15P▲	340 lbs. (154 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	340 lbs. (154 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	340 lbs. (154 kg)
FSHC-17W2D	4 Lexan® Doors Pass-Through	25.95"W x 35.1"D x 73.6"H (659 x 892 x 1869 mm)	120	60	1650	13.8	NEMA 5-15P▲	389 lbs. (177 kg)
			208-240	60	1608-2133	7.7-8.9	NEMA 6-15	389 lbs. (177 kg)
			220-240	50	1800-2142	8.2-8.9	CEE 7/7 Schuko or BS-1363 or No Plug	389 lbs. (177 kg)

* Shipping weight includes packaging.
▲ Canadian models use NEMA 5-20P.

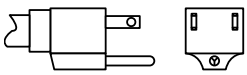
CABINET OPENING DIMENSIONS
FSHC-12W: 22" W X 43.5" H (559 X 1105 mm)
FSHC-17W: 22" W X 59.75" H (559 X 1517 mm)

WATER RESERVOIR CAPACITY
2 gallons (7.5 liters).

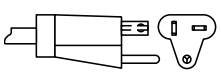
CORD LOCATION
Facing controls, right-hand side panel, lower right corner.

PLUG CONFIGURATIONS

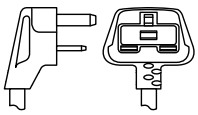
NEMA 5-15P



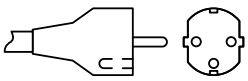
NEMA 5-20P



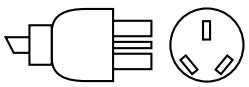
BS-1363



CEE 7/7 Schuko



AS 3112



PRODUCT SPECS
Flav-R-Savor® Portable Holding Cabinets

The Tall Humidified Holding Cabinet shall be a Flav-R-Savor® Model … , rated at … volts, and … watts, by the Hatco Corporation, Milwaukee, WI 53234 U.S.A.

The Cabinet shall consist of stainless steel construction with … door(s), universal slides on 3" (76 mm) centers (adjustable on 1.5" (38 mm) centers), insulated walls, 5" (127 mm) casters (two swivel with wheel locks and 2 rigid) and a 10' (3048 mm) cord with plug attached. It shall include a water reservoir, electronic controls, and On/Off power switch.

Accessories shall include additional slides and sheet pans.

Warranty consists of 24/7 parts and service assistance (U.S. and Canada only).

HATCO CORPORATION | P.O. Box 340500 Milwaukee, WI 53234-0500 U.S.A. | (800) 558-0607 | (414) 671-6350
www.hatcocorp.com | support@hatcocorp.com | Find a Hatco Rep | Image Library | Document Library | Patents | Chat

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Submittal Sheet

09/15/2026

ITEM# 2.22A - HOT HOLDING CABINET, PASS THROUGH (FUTURE) (1 REQ'D)

Custom FUTURE

FUTURE

Description: HOT HOLDING CABINET, PASS THROUGH (FUTURE)

Notes: FUTURE

11 40 01-232

Submittal Sheet

09/15/2026

ITEM# 2.23 - REFRIGERATOR, REACH-IN (EXISTING/RELOCATED) (1 REQ'D)

Custom EXISTING / RELOCATED

EXISTING / RELOCATED

11 40 01-233

Description: REFRIGERATOR, REACH-IN (Existing/Relocated)

Notes: EXISTING / RELOCATED

11 40 01-234

Submittal Sheet

09/15/2026

ITEM# 2.24 - WORKTABLE (2 EA REQ'D)

Advance Tabco SS-305

Work Table, 60"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	2	TA-25S-4	Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

11 40 01-235

WORK TABLES

PREMIUM Series - Flat Top - UNDERSHELF Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with 1-5/8" sanitary rolled rim edges on front & back and square side edges.

To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

SS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel. 1" adjustable **stainless steel** bullet feet. Stainless steel gussets.

GLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel. 1" adjustable plastic bullet feet. Galvanized steel gussets.

SS-Series: Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	SS-240	SS-300	
24"	SS-242	SS-302	
36"	SS-243	SS-303	SS-363
48"	SS-244	SS-304	SS-364
60"	SS-245	SS-305	SS-365
72"	SS-246	SS-306	SS-366
84"	SS-247	SS-307	SS-367
96"	SS-248	SS-308	SS-368
108"	SS-249	SS-309	SS-369
120"	SS-2410	SS-3010	SS-3610
132"	SS-2411	SS-3011	SS-3611
144"	SS-2412	SS-3012	SS-3612

NSF

GLG-Series: Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	GLG-240	GLG-300	
24"	GLG-242	GLG-302	
36"	GLG-243	GLG-303	GLG-363
48"	GLG-244	GLG-304	GLG-364
60"	GLG-245	GLG-305	GLG-365
72"	GLG-246	GLG-306	GLG-366
84"	GLG-247	GLG-307	GLG-367
96"	GLG-248	GLG-308	GLG-368
108"	GLG-249	GLG-309	GLG-369
120"	GLG-2410	GLG-3010	GLG-3610
132"	GLG-2411	GLG-3011	GLG-3611
144"	GLG-2412	GLG-3012	GLG-3612

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

ADVANCE TABCO
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

For Orders & Customer Service:
Email: customer@advancetabco.com or **Fax:** 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

DIMENSIONS and SPECIFICATIONS

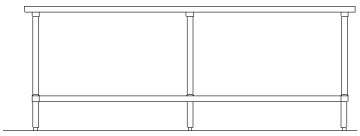
11-49-01-236

ALL DIMENSIONS ARE TYPICAL TOL ± .500”

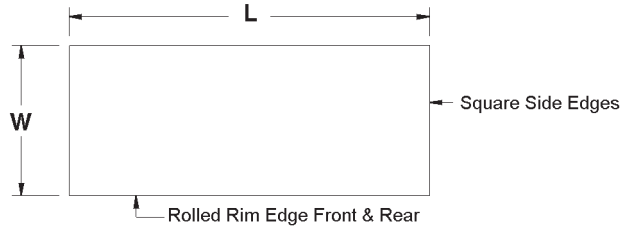
All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

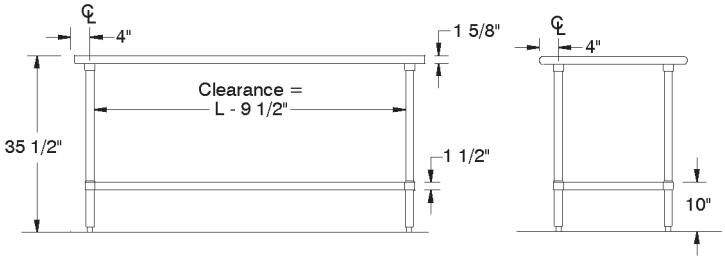
SS & GLG Series
Undershelf Style
FLAT TOP

Finished size of undershelf = Length minus 5 3/4”
Width minus 5 3/4”



Units 8 ft. and larger are furnished with six (6) legs





SS-Series: Stainless Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	SS-240	60 lbs.	SS-300	67 lbs.		
24”	SS-242	45 lbs.	SS-302	54 lbs.		
36”	SS-243	65 lbs.	SS-303	74 lbs.	SS-363	80 lbs.
48”	SS-244	78 lbs.	SS-304	92 lbs.	SS-364	100 lbs.
60”	SS-245	92 lbs.	SS-305	112 lbs.	SS-365	122 lbs.
72”	SS-246	108 lbs.	SS-306	132 lbs.	SS-366	142 lbs.
84”	SS-247	128 lbs.	SS-307	149 lbs.	SS-367	165 lbs.
96”	SS-248	158 lbs.	SS-308	175 lbs.	SS-368	195 lbs.
108”	SS-249	245 lbs.	SS-309	286 lbs.	SS-369	305 lbs.
120”	SS-2410	295 lbs.	SS-3010	333 lbs.	SS-3610	338 lbs.
132”	SS-2411	320 lbs.	SS-3011	351 lbs.	SS-3611	373 lbs.
144”	SS-2412	345 lbs.	SS-3012	379 lbs.	SS-3612	400 lbs.

GLG-Series: Galvanized Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	GLG-240	60 lbs.	GLG-300	67 lbs.		
24”	GLG-242	45 lbs.	GLG-302	54 lbs.		
36”	GLG-243	65 lbs.	GLG-303	74 lbs.	GLG-363	80 lbs.
48”	GLG-244	78 lbs.	GLG-304	92 lbs.	GLG-364	100 lbs.
60”	GLG-245	92 lbs.	GLG-305	112 lbs.	GLG-365	122 lbs.
72”	GLG-246	108 lbs.	GLG-306	132 lbs.	GLG-366	142 lbs.
84”	GLG-247	128 lbs.	GLG-307	149 lbs.	GLG-367	165 lbs.
96”	GLG-248	158 lbs.	GLG-308	175 lbs.	GLG-368	195 lbs.
108”	GLG-249	245 lbs.	GLG-309	286 lbs.	GLG-369	305 lbs.
120”	GLG-2410	295 lbs.	GLG-3010	333 lbs.	GLG-3610	338 lbs.
132”	GLG-2411	320 lbs.	GLG-3011	351 lbs.	GLG-3611	373 lbs.
144”	GLG-2412	345 lbs.	GLG-3012	379 lbs.	GLG-3612	400 lbs.

ADVANCE TABCO
SMART FABRICATION™

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

325 Wireless Boulevard, Hauppauge, NY 11788
© ADVANCE TABCO, AUGUST 2013

11 40 01-237

TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



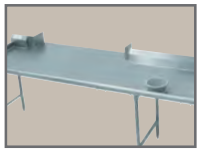
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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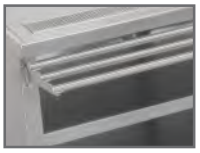
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TABLE MODIFICATIONS & ACCESSORIES

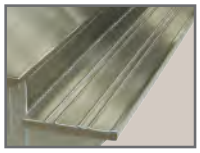
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



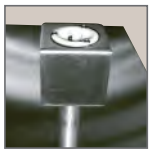
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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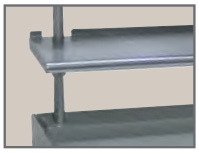
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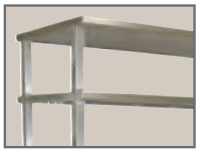
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



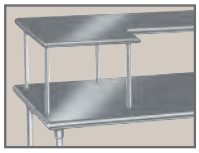
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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Submittal Sheet

09/15/2026

ITEM# 2.25 - WATER FILTER (1 EA REQ'D)

Everpure EV979750

KleenSteam® CT System, 6000 gallon capacity, 1.67 gpm flow rate, total system for steamers prevents limescale formation, (1) 4CB5 carbon filter, (1) SS-10 scale inhibitor Cartridge, dip tube, (2) 7 oz. packs ScaleKleen® (EV979750)

EVERPURE® KLEENSTEAM® CT

TOTAL WATER TREATMENT SYSTEM FOR STEAM APPLICATIONS.

Kleensteam CT System: EV9797-50
4CB5 Replacement Cartridge: EV9617-16
SS-IMF Cartridge: EV9799-32



APPLICATIONS

Commercial Steam

Countertop Steamers

FEATURES • BENEFITS

Sophisticated Hydroblend compound prevents limescale formation in steam applications

A total system delivering high quality filtered water with cleaning and deliming capabilities

Filters incoming water to improve the performance, maximize energy efficiency and increase the life of steam equipment

Reduces chlorine-induced corrosion

System is simple to install, operate and maintain

Longer lasting SS-IMF Cartridge is more effective in higher alkalinity/hardness/TDS/temperature installations

Easy deliming with Everpure's ScaleKleen, which is fed directly into the boiler through the SR-X Bowl without boiler disassembly or the use of dangerous acids

ScaleStick is NSF® Certified under NSF/ANSI Standard 42 for material requirements only

INSTALLATION TIPS

Choose a mounting location suitable to support the full weight of the system when operating.

Use 3/8" water line.

Connect the system to the incoming cold water boiler line only. Do not connect system to the condenser.

Install vertically with cartridges hanging down.

Allow 2 ½" (6.35 cm) clearance below the cartridge for easy cartridge replacement.

Flush cartridges by running water through system for five (5) minutes at full flow.

OPERATION TIPS

Change 4CB5 Cartridge on a regular six (6) month preventative maintenance program.

Change SS-IMF Cartridge before Hydroblend™ compound is completely used up.

Change cartridges when capacity is reached or when pressure falls below 10 psi (0.7 bar).

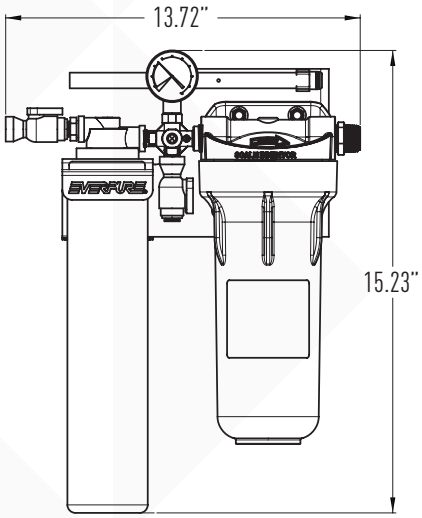
Service flow rate must not exceed 1.67 gpm (6.3 Lpm).

Always flush the filter cartridge at time of installation and cartridge change.

SIZING

Service Flow Rate: Maximum 1.67 gpm (6.3 Lpm)

EVERPURE® KLEENSTEAM® CT
EV9797-50



The contaminants or other substances removed or reduced by this drinking water system are not necessarily in your water. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

SPECIFICATIONS

Service Flow Rate
Maximum 1.67 gpm (6.3 Lpm)

Pressure Requirements
10 - 125 psi (0.7 - 8.6 bar), non-shock

Maximum Water Temperature at Inlet
80°F (27°C)

Overall Dimensions
15.23" L x 13.72" W x 6.23" D
(38.6 cm x 34.8 cm x 23.5 cm)

Inlet Connection
3/8"

Outlet Connection
3/8"

Operating Weight
18 lbs (8.1 kgs)

Shipping Weight
15 lbs (6.8 kgs)

Electrical Connection
None required

Alkalinity Range
2 to 12 grains per gallon

WARRANTY

Everpure water treatment systems by Pentair® (excluding replaceable elements) are covered by a limited warranty against defects in material and workmanship for a period of five years after date of purchase. Everpure replaceable elements (filter cartridges and water treatment cartridges) are covered by a limited warranty against defects in material and workmanship for a period of one year after date of purchase. See printed warranty for details. Pentair will provide a copy of the warranty upon request.

PENTAIR

WATER QUALITY SYSTEMS

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Submittal Sheet

09/15/2026

ITEM# 2.26 - WATER FILTER (1 EA REQ'D)

Everpure EV979722

KleenSteam II Twin System, 20,000 gallon capacity, 5.0 gpm flow rate, total system for steamers prevents limescale formation, (2) 7CB5 carbon filters, (1) SS-10 scale inhibitor Cartridge, dip tube, (2) 2.2 lbs. canisters ScaleKleen® (EV979722)

EVERPURE® KLEENSTEAM® II TWIN SYSTEM

EVERPURE'S SECOND GENERATION OF TOTAL WATER TREATMENT SYSTEM FOR STEAM APPLICATIONS

Kleensteam II Twin System: EV9797-22
7CB5 Replacement Cartridge: EV9618-11
SS-10 Cartridge: EV9799-02



APPLICATIONS

Commercial Steam

Foodservice Steamer

Combi Oven

FEATURES • BENEFITS

Sophisticated Hydroblend compound prevents limescale formation in high temperature steam applications

A total system delivering high quality filtered water with cleaning and deliming capabilities

Filters incoming water to improve the performance, maximize energy efficiency and increase the life of steam equipment

New dual cartridge design provides enhanced performance for low or high flow capacity steamers and flexibility for expanding to meet future needs

Reduces chlorine-induced corrosion

System is simple to install, operate and maintain

The Kleensteam II Twin System is shipped with two 7CB5 cartridges and no filter head plug

Longer lasting SS-10 Cartridge is more effective in higher alkalinity/hardness/TDS/temperature installations

ScaleStick is NSF® Certified under NSF/ANSI Standard 42 for materials

Easy deliming with Everpure ScaleKleen, which is fed directly into the boiler through the SR-X Bowl without use of hazardous chemicals or special piping

INSTALLATION TIPS

Choose a mounting location suitable to support the full weight of the system when operating.

Use minimum 1/2" inlet water line (3/4" preferred).

Connect the system to the boiler water only. Do not connect system to the condenser.

Install vertically with cartridges hanging down.

Allow 2 ½" (6.35 cm) clearance below the cartridge for easy cartridge replacement.

Flush cartridges by running water through system for five (5) minutes at full flow.

OPERATION TIPS

Change 7CB5 Cartridge on a regular six (6) month preventative maintenance program, when capacity is reached or when pressure falls below 10 psi (0.7 bar).

Change SS-10 Cartridge before Hydroblend™ compound is completely used up.

Service flow rate must not exceed 2.5 gpm (9.46 Lpm) for single cartridge systems or 5.0 gpm (18.92 Lpm) for dual cartridge systems.

Always flush the filter cartridge at time of installation and cartridge change.

Use for periodic deliming as needed by installing the dip tube assembly in place of the SS-10 and dissolving ScaleKleen in SR-X housing. Full deliming instructions are provided with the system.

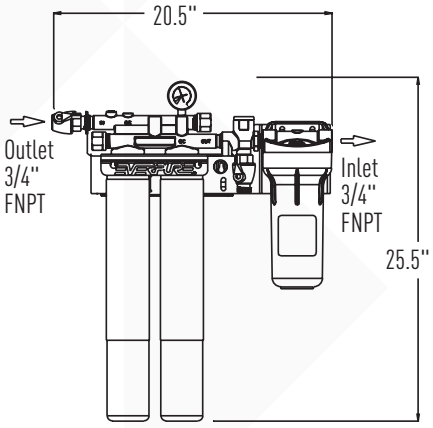
SIZING

Service Flow Rate:

Maximum 2.5 gpm (9.5 Lpm) single cartridge

Maximum 5.0 gpm (18.9 Lpm) dual cartridge

EVERPURE® KLEENSTEAM® II TWIN SYSTEM
EV9797-22



The contaminants or other substances removed or reduced by this drinking water system are not necessarily in your water. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

SPECIFICATIONS

Service Flow Rate
Maximum 2.5 gpm (9.5 Lpm) single cartridge

Maximum 5.0 gpm (18.9 Lpm) dual cartridge

Pressure Requirements
10 - 125 psi (0.7 - 8.6 bar), non-shock

Maximum Water Temperature at Inlet
100°F (38°C)

Overall Dimension
25.5" H x 20.5" W x 7" D
(64.7 cm x 52.0 cm x 17.7 cm)

Inlet Connection
3/4" FNPT

Outlet Connection
3/4" FNPT

Operating Weight
35 lbs (15.8 kgs)

Shipping Weight
28 lbs (12.7 kgs)

Electrical Connection
None required

Alkalinity Range
2 to 12 grains per gallon

WARRANTY

Everpure water treatment systems by Pentair® (excluding replaceable elements) are covered by a limited warranty against defects in material and workmanship for a period of five years after date of purchase. Everpure replaceable elements (filter cartridges and water treatment cartridges) are covered by a limited warranty against defects in material and workmanship for a period of one year after date of purchase. See printed warranty for details. Pentair will provide a copy of the warranty upon request.

PENTAIR

WATER QUALITY SYSTEMS

EVERPURE-SHURFLO WORLD HEADQUARTERS, 1040 MUIRFIELD DRIVE, HANOVER PARK, IL 60133 USA • FOODSERVICE.PENTAIR.COM
800.942.1153 (US ONLY) • 630.307.3000 MAIN • 630.307.3030 FAX • CSEVERPURE@PENTAIR.COM EMAIL

EVERPURE-SHURFLO AUSTRALIA, 1-21 MONASH DRIVE, DANDENONG SOUTH, VIC 3175 AUSTRALIA
011.1300 576 190 TEL • 011.61.39.562.7237 FAX • AU.EVERPURE@PENTAIR.COM EMAIL

EVERPURE-SHURFLO CHINA, 21F CLOUD 9 PLAZA, NO 1118, SHANGHAI, 200052, CHINA
86.21.3211.4588 TEL • 86.21.3211.4580 FAX • CHINA.WATER@PENTAIR.COM EMAIL

EVERPURE-SHURFLO INDIA, GREEN BOULEVARD, B-9/A, 7TH FLOOR - TOWER B SECTOR 62, NOIDA - 201301
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EVERPURE-SHURFLO EUROPE, PENTAIR WATER BELGIUM BVBA, INDUSTRIEPARK WOLFSTEE, TOEKOMSTLAAN 30, B-2200 HERENTALS, BELGIUM
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EVERPURE-SHURFLO JAPAN INC., HASHIMOTO MN BLDG. 7F, 3-25-1 HASHIMOTO, MIDORI-KU, SAGAMIHARA-SHI KANAGAWA 252-0143, JAPAN
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11 40 01-247

Submittal Sheet

09/15/2026

ITEM# 2.27 - SHELVING, UNIT (6 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	24	MQ2148G	MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	24	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	12	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	12	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

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Item # _____

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We put space to work.

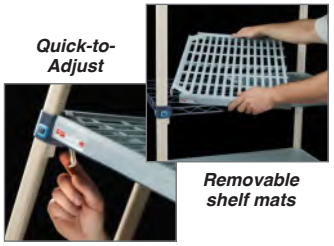
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

We put space to work.

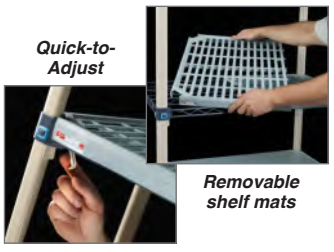
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
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- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



11 40 01-252

Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

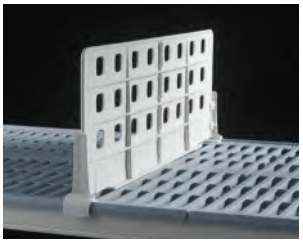
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

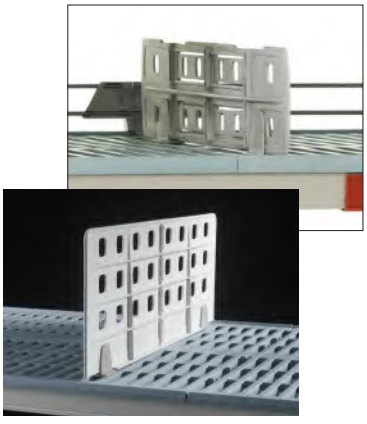
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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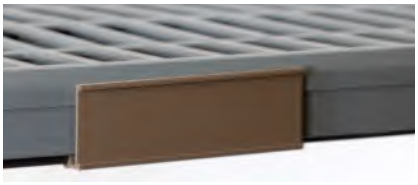
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.

i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152





MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp

Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate

Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp

Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

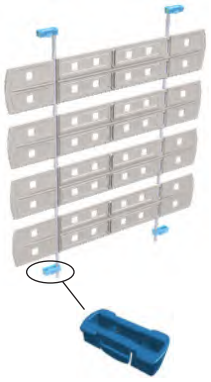
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



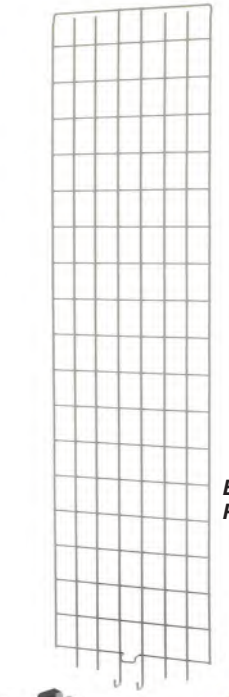
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

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MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



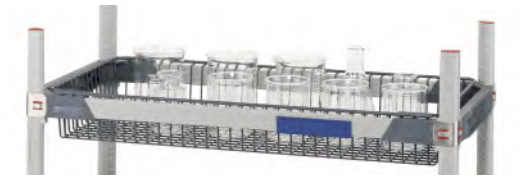
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

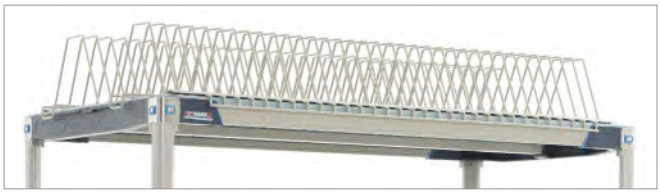
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

23141 SUNY Faye Corey Student Union

Job _____

11.40.01.259

MetroMax® Accessories

We put space to work.

"S" Hooks

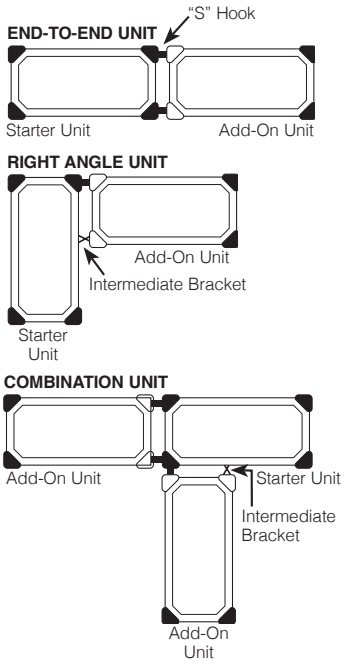
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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GROUP

The Spirit of Excellence

11 40 01-260

Submittal Sheet

09/15/2026

ITEM# 2.28 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-261

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-262

Submittal Sheet

09/15/2026

ITEM# 2.29 - SHELVING, WALL MOUNTED (1 EA REQ'D)

Advance Tabco WS-12-72

Shelf, wall-mounted, 72"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

WALL SHELVES

11 40 01-263

NSF



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



FEATURES:

Brackets can be positioned to accommodate wall studs.

Furnished with a 1-5/8" Bullnose edge with a 1-1/2" turn-up edge at rear. Ends are turned down square.

MATERIAL:

16 Gauge Series - 304 stainless steel polished to a satin finish.

18 Gauge Series - 430 stainless steel polished to a satin finish.

CONSTRUCTION:

Secured to wall by means of bolts through support brackets.

Units 7 ft. and larger are furnished with 3 brackets.

	10" Wide			12" Wide			15" Wide			18" Wide			
L	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	Approx. Cu. Ft.
24"	WS-10-24-16	WS-10-24	8 lbs.	WS-12-24-16	WS-12-24	9 lbs.	WS-15-24-16	WS-15-24	11 lbs.	WS-18-24-16	WS-18-24	14 lbs.	3
30"	-	-	-	WS-12-30-16	WS-12-30	12 lbs.	-	-	-	-	-	-	4
36"	WS-10-36-16	WS-10-36	10 lbs.	WS-12-36-16	WS-12-36	12 lbs.	WS-15-36-16	WS-15-36	15 lbs.	WS-18-36-16	WS-18-36	21 lbs.	4
42"	-	-	-	WS-12-42-16	WS-12-42	14 lbs.	-	-	-	-	-	-	5
48"	WS-10-48-16	WS-10-48	12 lbs.	WS-12-48-16	WS-12-48	14 lbs.	WS-15-48-16	WS-15-48	18 lbs.	WS-18-48-16	WS-18-48	24 lbs.	5
60"	WS-10-60-16	WS-10-60	15 lbs.	WS-12-60-16	WS-12-60	17 lbs.	WS-15-60-16	WS-15-60	23 lbs.	WS-18-60-16	WS-18-60	28 lbs.	6
72"	WS-10-72-16	WS-10-72	17 lbs.	WS-12-72-16	WS-12-72	21 lbs.	WS-15-72-16	WS-15-72	28 lbs.	WS-18-72-16	WS-18-72	32 lbs.	7
84"	WS-10-84-16	WS-10-84	20 lbs.	WS-12-84-16	WS-12-84	25 lbs.	WS-15-84-16	WS-15-84	32 lbs.	WS-18-84-16	WS-18-84	36 lbs.	8
96"	WS-10-96-16	WS-10-96	23 lbs.	WS-12-96-16	WS-12-96	28 lbs.	WS-15-96-16	WS-15-96	36 lbs.	WS-18-96-16	WS-18-96	42 lbs.	10
108"	WS-10-108-16	WS-10-108	28 lbs.	WS-12-108-16	WS-12-108	32 lbs.	WS-15-108-16	WS-15-108	40 lbs.	WS-18-108-16	WS-18-108	48 lbs.	11
120"	WS-10-120-16	WS-10-120	32 lbs.	WS-12-120-16	WS-12-120	36 lbs.	WS-15-120-16	WS-15-120	44 lbs.	WS-18-120-16	WS-18-120	54 lbs.	12
132"	WS-10-132-16	WS-10-132	36 lbs.	WS-12-132-16	WS-12-132	42 lbs.	WS-15-132-16	WS-15-132	49 lbs.	WS-18-132-16	WS-18-132	60 lbs.	13
144"	WS-10-144-16	WS-10-144	40 lbs.	WS-12-144-16	WS-12-144	48 lbs.	WS-15-144-16	WS-15-144	55 lbs.	WS-18-144-16	WS-18-144	66 lbs.	14

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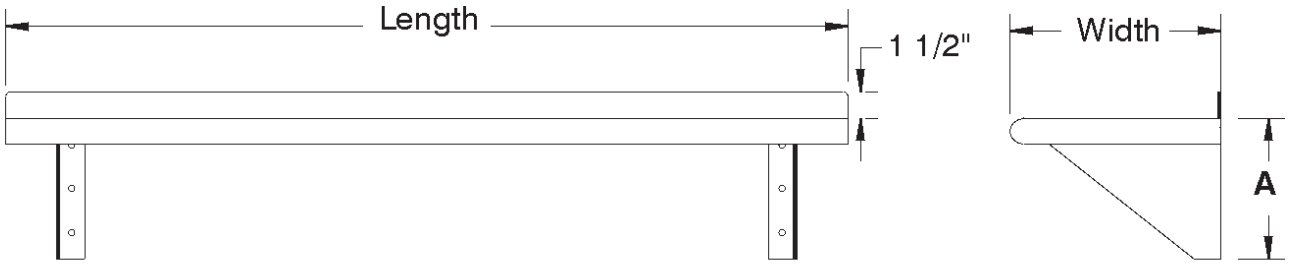
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DETAILS and SPECIFICATIONS

11 40 01-264

TOL ± .500”

ALL DIMENSIONS ARE TYPICAL



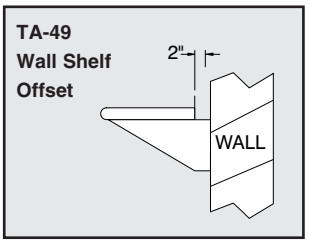
Width	A
10”	8 1/2”
12”	10 1/2”
15”	13 1/2”
18”	16 1/2”

Load Capacity = 20 lbs. per sq. ft.

(Evenly Distributed Weight)

Wall Shelf Options

PRT-1	Printer Shelf
TA-22A	Square Edge Shelf
TA-26	Welded Shelf Brackets
TA-49	Wall Shelf 2” Offset
TA-71	Heat Lamp Provision
TA-77	Check Minder
TA-77A	Concealer for Heat Lamp (Requires TA-77)
TA-99A	14 Ga. S/S 304 Upgrade for Overshelves
TA-100A	Bullnose Edge On All 4 Sides of Shelf
TA-102	6” Cantilever Shelf Offset





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ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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11 40 01-265

Submittal Sheet

09/15/2026

ITEM# 2.30 - SOILED DISHTABLE W/ THREE COMPARTMENT SINK (1 EA REQ'D)

Advance Tabco DTS-D30-84L

Dishlanding-Soil Dishtable, L-shaped with landing, attaches to left of dish machine operator, 10-1/2"H backsplash, with pre-rinse sink, stainless steel legs with crossrails front to back, 83" long, 14/304 stainless steel, Includes prerinse basket with slide bar (slide bar only when K-461 or K-disposer adapter is specified)

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	DTA-56	Additional drainboard area on machine side (priced per linear foot)
Advance Tabco	1	DTA-75	Provision for limit switch (limit switch by others)
Advance Tabco	3	DTA-99E	Sink Bowl, 24"W x 24"D x 14" deep, welded into top, (per bowl) (must specify sink location)
Advance Tabco	3	FC-455F	Sink Cover, stainless steel, for 24" x 24" fabricated bowl (rests on edges of sink bowl such that the sink cover will be approximately flush with the tabletop or drainboard work surface)
Advance Tabco	3	K-15	Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections
Advance Tabco	3	K-4	Support Bracket, for lever waste drain handle, (1) support required for each lever drain
Advance Tabco	2	K-472	Faucet hole revision (each)
Advance Tabco	7	DTA-79	6'6" Long Double Sided Slant Tubular Rack Sorting Shelf, table mounted (sold per linear foot) (minimum 4 ft), field convertible to allow racks to sit back to back (steeper angle) or one side or the other (lower angle), see spec sheet for details

STAINLESS STEEL

DISHTABLES
DISHLANDING SOIL

11 40 01-266

NEW *Tile Edge Design*

Item #: _____ Qty #: _____
Model #: _____
Project #: _____



SPEC-LINE
DTS-D60-72L Shown

10-1/2" EXTRA LARGE Bold Looking Backsplash with 2" return and tile edge



Spec-Line: 14 ga. 304 Series Stainless Steel Top.
16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

UPGRADED!
Standard: 16 ga. 304 Series Stainless Steel Top.
16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

Super Saver: 16 ga. 304 Series Stainless Steel Top.
Galvanized Legs with Plastic Bullet Feet.

FEATURES:

Tile edge for ease of installation.
STANDARD & SUPERSAVER SOIL section features 5" deep sink bowl.
SPEC-LINE SOIL section features 8" deep sink bowl.
Dishtable system consists of SOIL and CLEAN sections.
Table is furnished with 10-1/2" splash with a 2" return.

CONSTRUCTION:

All TIG welded.
Welded areas blended to match adjacent surfaces and to a satin finish.
Stainless Steel Gussets welded to a stainless steel support channel.

MECHANICAL:

Faucet holes in SPLASH punched on 8" centers, faucet not included.
Waste drain is 1 1/2" IPS basket type and is included.

ACCESSORIES	Model #	Qty
Faucet		
Wall Shelf		
Undershelf		

Nominal sizing on all dishtables for ease of installation.

		14 Gauge 304 16 Ga. Stainless Steel Legs	16 Gauge 304 Stainless Steel Legs	16 Gauge 304 Galvanized Legs	
Nominal Size	**"L"**	**SPEC-LINE**	**STANDARD**	**SUPER SAVER**	**Approx. Wt.**
4 Ft.	47"	**DTS-D30-48L or R**	**DTS-D70-48L or R**	**DTS-D60-48L or R**	180 lbs.
5 Ft.	59"	**DTS-D30-60L or R**	**DTS-D70-60L or R**	**DTS-D60-60L or R**	205 lbs.
6 Ft.	71"	**DTS-D30-72L or R**	**DTS-D70-72L or R**	**DTS-D60-72L or R**	230 lbs.
7 Ft.	83"	**DTS-D30-84L or R**	**DTS-D70-84L or R**	**DTS-D60-84L or R**	240 lbs.
8 Ft.	95"	**DTS-D30-96L or R**	**DTS-D70-96L or R**	**DTS-D60-96L or R**	255 lbs.
9 Ft.	107"	**DTS-D30-108L or R**	**DTS-D70-108L or R**	**DTS-D60-108L or R**	320 lbs.
10 Ft.	119"	**DTS-D30-120L or R**	**DTS-D70-120L or R**	**DTS-D60-120L or R**	380 lbs.
12 Ft.	143"	**DTS-D30-144L or R**	**DTS-D70-144L or R**	**DTS-D60-144L or R**	390 lbs.

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DIMENSIONS and SPECIFICATIONS

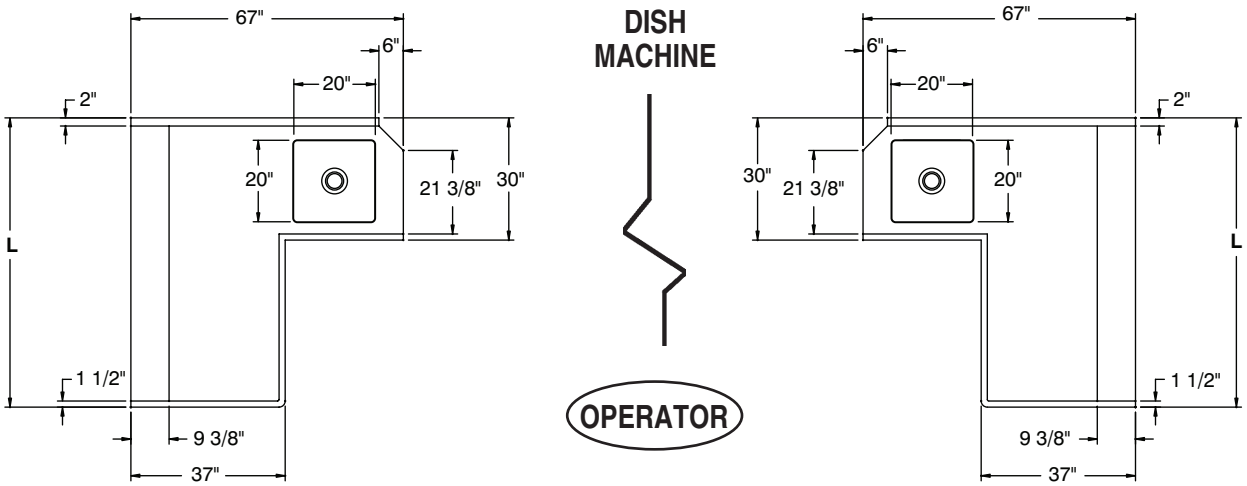
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TOL ± .500”

ALL DIMENSIONS ARE TYPICAL

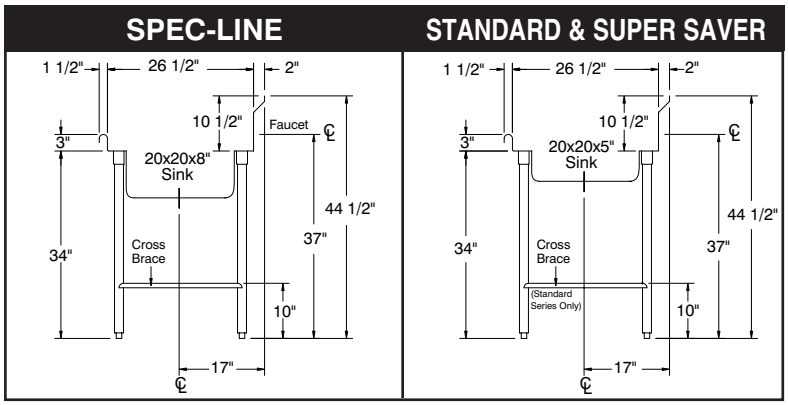
SEE DISH MACHINE COMPATIBILITY CHART TO ENSURE PROPER FIT

Dish Machine Compatibility Chart can be found on our website at www.advancetabco.com under “Product Support”



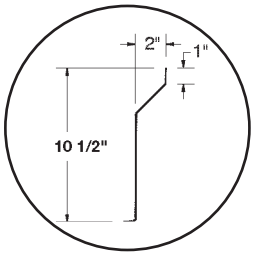
DISHLANDING SOIL LEFT

DISHLANDING SOIL RIGHT



CUSTOMIZE YOUR OWN SYSTEM
by Ordering Optional Accessories from our
PRODUCT & PRICE GUIDE

Splash Detail



Description	SPEC-LINE	STANDARD	SUPER SAVER
Material	**14 Ga. 304 Series**	**16 Ga. 304 Series**	**16 Ga. 304 Series**
1 5/8” Dia. Legs	Stainless Steel	Stainless Steel	galvanized
Gussets	Stainless Steel	Stainless Steel	Stainless steel
Bullet Feet (1” adj.)	Stainless Steel	Stainless Steel	Plastic
Cross Bracing	Welded	Welded	Optional
Prerinse Bowl Depth	8”	5”	5”
Prerinse Basket	Included	Optional	Optional

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11 40 01-268

Dishtable Modifications & Accessories



DTA-95



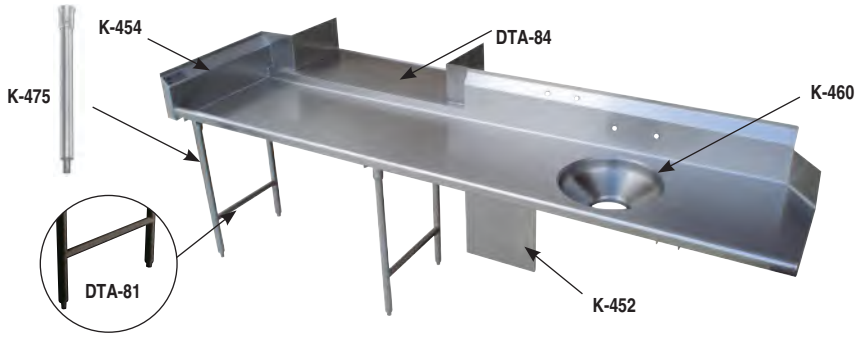
DTA-87



DTA-82



DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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SMART FABRICATION™

ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

⚠ WARNING: 11 40 01-269
Faucet(s) on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

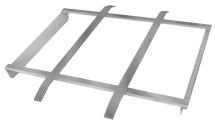
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



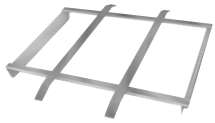
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets
T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5



Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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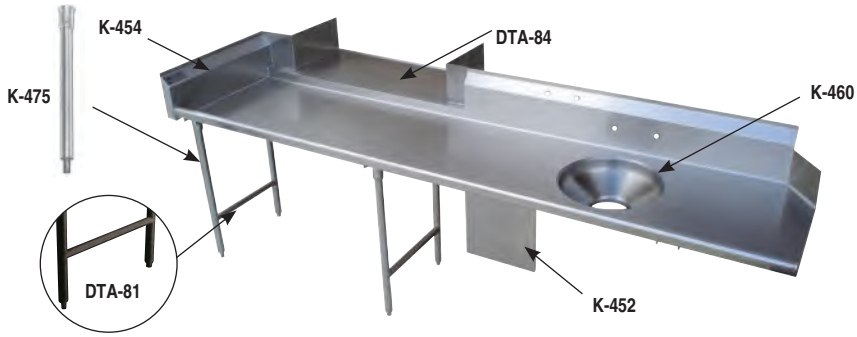
Dishtable Modifications & Accessories


DTA-95


DTA-87


DTA-82


DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

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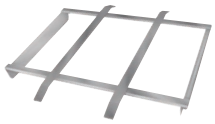
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



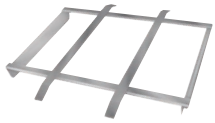
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets
T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5



Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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Dishtable Modifications & Accessories



DTA-95



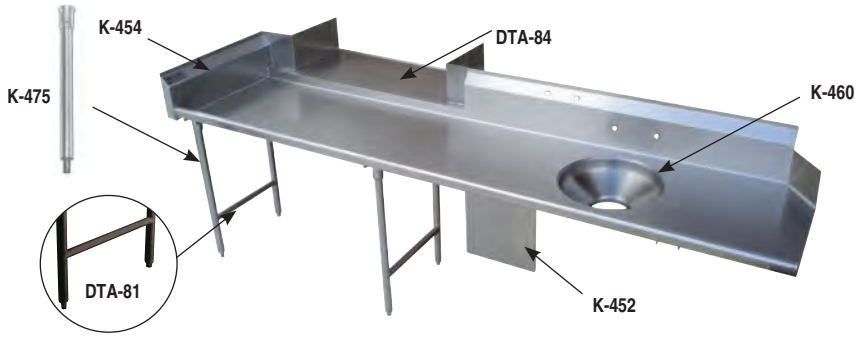
DTA-87



DTA-82



DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

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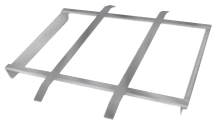
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



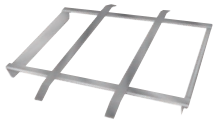
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets
T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5



Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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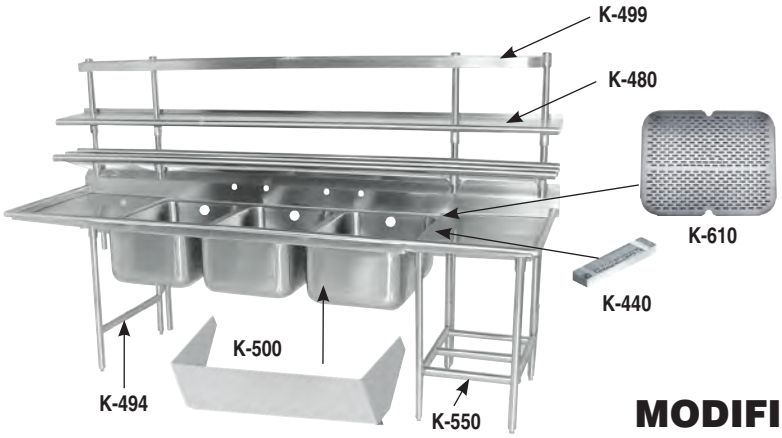
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SINK MODIFICATIONS & ACCESSORIES

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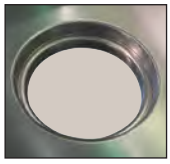
K-37 Anti-Siphon Vacuum Braker Holes



K-72 Leg-To-Wall Brace



K-460A Disposal Cone w/ Control Bracket & Faucet Holes



K-461A Install Collar w/ Control Bracket

MODIFICATIONS

K-4	Support Bracket for Lever Waste Drain Handle
K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Holes
K-57	Welded field Joint *(Welded in field by others)*
K-76	Paint on Sound Deadening
K-77	Splash Cutout (Pipe Chase)
K-106	Mirror Highlite Edge for Sink
K-440	Waste Trough with 2" deep removable basket
K-447	High Backsplash up to 18"
K-448	High Backsplash up to 13"
K-450	Extra Drainboard
K-451	Drainboard Corner Turn
K-452	Control Bracket 8" x 12"
K-452S	Splash Mounted Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-453S	Splash Mounted Control Bracket 14" x 16"
K-454	Sidesplash
K-456	Scrap Block Installed
K-460	Installation of Disposal Cone with 8" x 12" Control Bracket, Faucet Holes *(Cone supplied by others)*
K-460A	Installation of Disposal Cone with 14" x 16" Control Bracket, Faucet Holes *(Cone supplied by others)*

K-461	Install Collar with 8" x 12" control bracket *(Collar by others)*
K-461A	Install Collar with 14" x 16" control bracket *(Collar by others)*
K-470	Modify Bowl Depth
K-472	Faucet Hole Revision
K-473	Working Height Revision
K-476	Punch for Over Flow Holes *(Holes Only. N/C when ordering K-15)*
K-479	Undershelf Under Drainboard
K-480	Stainless Steel 12" Wide Shelf *(min. of 3 ft.)*
K-480A	Stainless Steel 15" Wide Shelf *(min. of 3 ft.)*
K-490	Provision for Pot Washer *(For "Wells-PW-106" only)*
K-491	Provision for Hatco Heater
K-495	Turn Down Backsplash *(Includes 2 Brackets. See K-397 Addt'l Sets)*
K-498	Tubular Overshelf 12" wide (Min. 3 Ft.)
K-499	Stainless Steel Pot Rack
K-500	Stainless Steel Apron to Cover Sink Bowls
K-500A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
K-508	Special Sizing Charge (Larger size cut down to smaller size
K-508A	Special Modification Charge
K-510	Prepare Sink for Undercounter Dishwasher *(24" drainboard or larger)*
K-520	Poly Board/Stainless Steel Cover Holder
K-550	Stainless Steel Tubular Rack Storage

ACCESSORIES

K-30	Faucet Wall Mounting Bracket
K-72	Leg To Wall Brace
K-350	Residential Finish & Packaging
K-397	Wall Brackets for Sink *(Brackets Included with K-495)*
K-457	Replacement Rubber Scrap Block *(See K-456 for install cost)*
K-474	16 ga., '304' Series S/S Leg with S/S Foot
K-475	S/S Legs with S/S Foot
K-478	Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-493	16 ga., '304' Series S/S Welded Leg Assembly with S/S Feet
K-494	S/S Welded Leg Assembly with S/S Feet
K-497	Galv. Welded Leg Assembly with Plastic Feet
K-497A	Galv. Individual Legs with Plastic Feet
K-496	Leg Assembly For Grease Interceptor w/ Adj. Cross-Bracing & S/S Feet *(For Grease Interceptors with 15" Ht. or less. Consult factory for larger Grease Interceptors)*
K-610	Perforated Stainless Steel Sink Grid *(Specify Bowl Size)*

SINK COVERS

	Choose Model # & Add The Proper Letter In Place Of The Underscore (_). Example: K-2A or FC-455H			
	FOR DEEP DRAWN BOWLS		FOR FABRICATED BOWLS	
Bowl Size	Poly Covers Model K-2_	S/S Covers Model K-455_	Poly Covers Model K-2_	S/S Covers Model FC-455_
16" x 20"	C	C	CF	C
20" x 20"	E	E	EF	E
24" x 24"	F	F	FF	F
10" x 14"	A	A	AF	A
20" x 28"	G	G	GF	G
14" x 16"	B	B	BF	B
18" x 24"	D	D	DF	D
18" x 18"	Not Available	Not Available	JF	J
20" x 24"	Not Available	Not Available	PF	P
24" x 36"	Not Available	Not Available	RF	R
20" x 30"	Not Available	Not Available	SF	S
24" x 30"	Not Available	Not Available	TF	T
15" x 15"	Not Available	Not Available	MF	M
14" x 14"	H	H	HF	H
12" x 20"	I	I	IF	I

Custom Covers Available. Consult Factory.

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Dishtable Modifications & Accessories



DTA-95



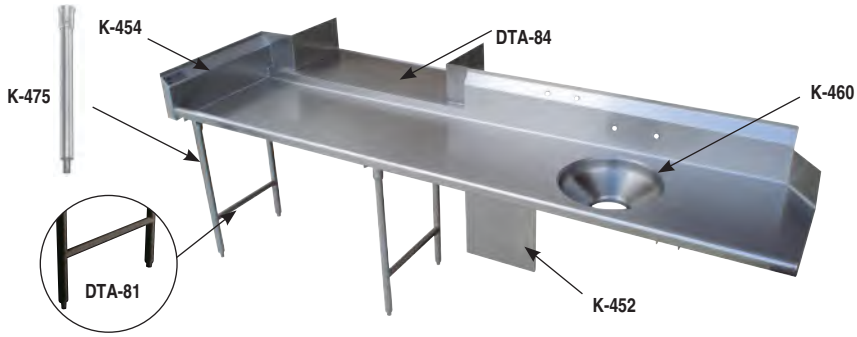
DTA-87



DTA-82



DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

⚠ WARNING: 11 40 01-276
Faucet(s) on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

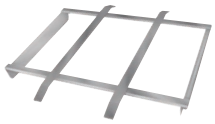
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



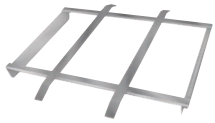
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets
T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5


Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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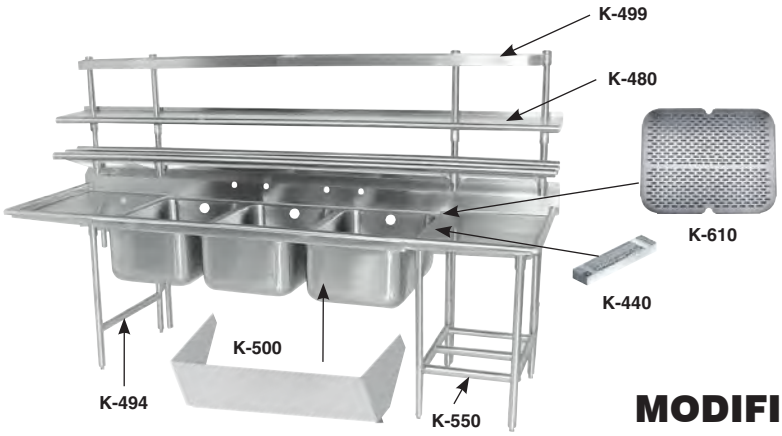
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SINK MODIFICATIONS & ACCESSORIES

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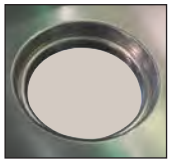
K-37 Anti-Siphon Vacuum Braker Holes



K-72 Leg-To-Wall Brace



K-460A Disposal Cone w/ Control Bracket & Faucet Holes



K-461A Install Collar w/ Control Bracket

MODIFICATIONS

K-4	Support Bracket for Lever Waste Drain Handle
K-23	Sink Legs Welded To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated. (Top Is Not Welded To Legs)
K-23A	Sink Legs Welded To Leg Gussets Under Sink Top & To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Holes
K-57	Welded field Joint *(Welded in field by others)*
K-76	Paint on Sound Deadening
K-77	Splash Cutout (Pipe Chase)
K-106	Mirror Highlite Edge for Sink
K-440	Waste Trough with 2" deep removable basket
K-447	High Backsplash up to 18"
K-448	High Backsplash up to 13"
K-450	Extra Drainboard
K-451	Drainboard Corner Turn
K-452	Control Bracket 8" x 12"
K-452S	Splash Mounted Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-453S	Splash Mounted Control Bracket 14" x 16"
K-454	Sidesplash
K-456	Scrap Block Installed
K-460	Installation of Disposal Cone with 8" x 12" Control Bracket, Faucet Holes *(Cone supplied by others)*
K-460A	Installation of Disposal Cone with 14" x 16" Control Bracket, Faucet Holes *(Cone supplied by others)*

K-461	Install Collar with 8" x 12" control bracket *(Collar by others)*
K-461A	Install Collar with 14" x 16" control bracket *(Collar by others)*
K-470	Modify Bowl Depth
K-472	Faucet Hole Revision
K-473	Working Height Revision
K-476	Punch for Over Flow Holes *(Holes Only. N/C when ordering K-15)*
K-479	Undershelf Under Drainboard
K-480	Stainless Steel 12" Wide Shelf *(min. of 3 ft.)*
K-480A	Stainless Steel 15" Wide Shelf *(min. of 3 ft.)*
K-490	Provision for Pot Washer *(For "Wells-PW-106" only)*
K-491	Provision for Hatco Heater
K-495	Turn Down Backsplash *(Includes 2 Brackets. See K-397 Addt'l Sets)*
K-498	Tubular Overshelf 12" wide (Min. 3 Ft.)
K-499	Stainless Steel Pot Rack
K-500	Stainless Steel Apron to Cover Sink Bowls
K-500A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
K-508	Special Sizing Charge (Larger size cut down to smaller size
K-508A	Special Modification Charge
K-510	Prepare Sink for Undercounter Dishwasher *(24" drainboard or larger)*
K-520	Poly Board/Stainless Steel Cover Holder
K-550	Stainless Steel Tubular Rack Storage
K-ROD	Weld Support Rods For Poly Sink Cover In Corners Of Sink Bowl

ACCESSORIES

K-30	Faucet Wall Mounting Bracket
K-72	Leg To Wall Brace
K-350	Residential Finish & Packaging
K-397	Wall Brackets for Sink *(Brackets Included with K-495)*
K-457	Replacement Rubber Scrap Block *(See K-456 for install cost)*
K-474	16 ga., '304' Series S/S Leg with S/S Foot
K-475	S/S Legs with S/S Foot
K-477	Replacement Leg Clamp For Adjustable Cross-Bracing
K-477C	Replacement Corner Leg Clamp For Adjustable Cross-Bracing
K-478	Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-493	16 ga., '304' Series S/S Welded Leg Assembly with S/S Feet
K-494	S/S Welded Leg Assembly with S/S Feet
K-497	Galv. Welded Leg Assembly with Plastic Feet
K-497A	Galv. Individual Legs with Plastic Feet
K-496	Leg Assembly For Grease Interceptor w/ Adj. Cross-Bracing & S/S Feet *(For Grease Interceptors with 15" Ht. or less. Consult factory for larger Grease Interceptors)*
K-610	Perforated Stainless Steel Sink Grid *(Specify Bowl Size)*

SINK COVERS

Choose Model # & Add The Proper Letter In Place Of The Underscore (_).
Example: K-2A or FC-455H

	FOR DEEP DRAWN BOWLS		FOR FABRICATED BOWLS	
Bowl Size	**Poly Covers Model K-2_**	**S/S Covers Model K-455_**	**Poly Covers Model K-2_**	**S/S Covers Model FC-455_**
10" x 14"	A	A	AF	A
12" x 20"	I	I	IF	I
14" x 14"	H	H	HF	H
14" x 16"	B	B	BF	B
15" x 15"	Not Available	Not Available	MF	M
15" x 24"	Not Available	Not Available	UF	U
16" x 20"	C	C	CF	C
18" x 18"	Not Available	Not Available	JF	J
18" x 24"	D	D	DF	D
20" x 20"	E	E	EF	E
20" x 24"	Not Available	Not Available	PF	P
20" x 28"	G	G	GF	G
20" x 30"	Not Available	Not Available	SF	S
24" x 30"	Not Available	Not Available	TF	T
24" x 24"	F	F	FF	F
24" x 36"	Not Available	Not Available	RF	R
30" x 30"	Not Available	Not Available	VF	V

Custom Covers Available. Consult Factory.

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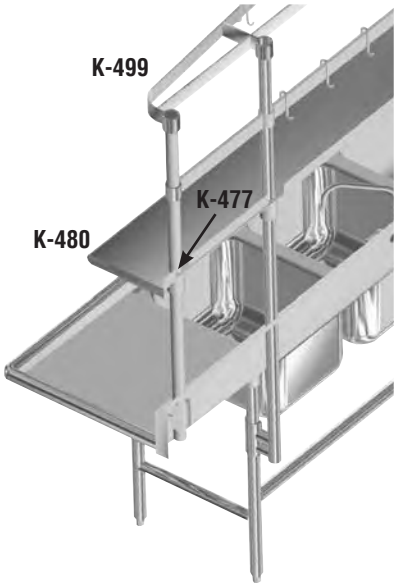
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POT RACK & TUBULAR OVERSHELF DETAILS AND SPECIFICATIONS

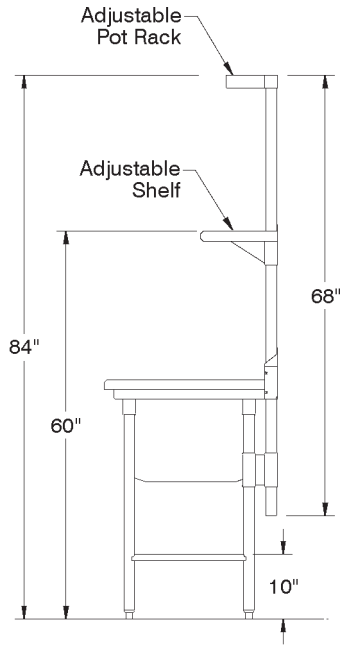
ADJUSTABLE POT RACK & SHELF



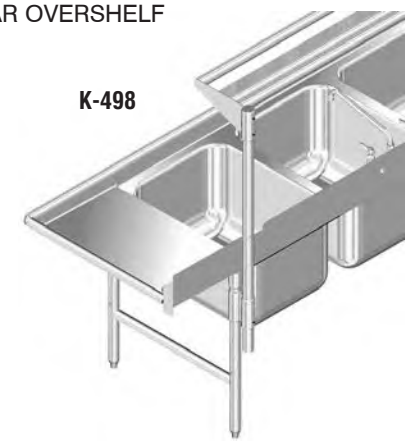
Item #: _____ Qty #: _____

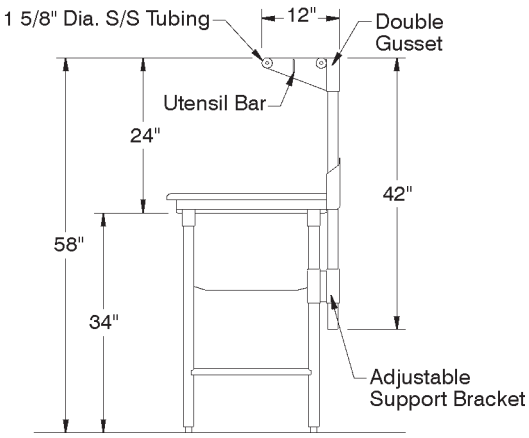
Model #: _____

Project #: _____

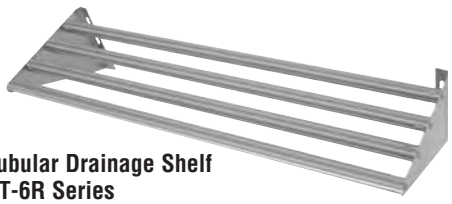


TUBULAR OVERSHELF





Model #	Description	Qty
K-477	Mounting Provision for Sink Mounted Pot Rack or Shelf	
K-480	12" Wide Stainless Steel Shelf	
K-498	Tubular Overshelf (min. 3 ft.)	
K-499	Stainless Steel Pot Rack	
DT-6R-36	3' Tubular Wall Mounted Drainage Shelf	
DT-6R-48	4' Tubular Wall Mounted Drainage Shelf	
DT-6R-60	5' Tubular Wall Mounted Drainage Shelf	
DT-6R-72	6' Tubular Wall Mounted Drainage Shelf	



Tubular Drainage Shelf
DT-6R Series

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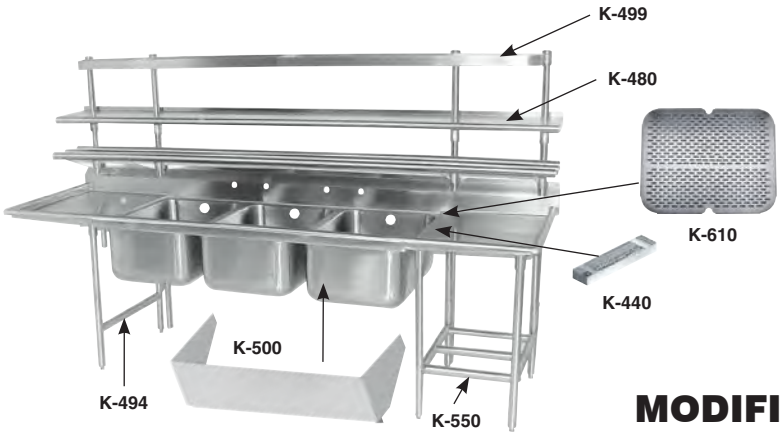
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SINK MODIFICATIONS & ACCESSORIES

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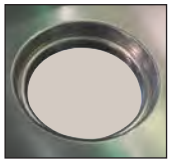
K-37 Anti-Siphon Vacuum Braker Holes



K-72 Leg-To-Wall Brace



K-460A Disposal Cone w/ Control Bracket & Faucet Holes



K-461A Install Collar w/ Control Bracket

MODIFICATIONS

K-4	Support Bracket for Lever Waste Drain Handle
K-23	Sink Legs Welded To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated. (Top Is Not Welded To Legs)
K-23A	Sink Legs Welded To Leg Gussets Under Sink Top & To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Holes
K-57	Welded field Joint *(Welded in field by others)*
K-76	Paint on Sound Deadening
K-77	Splash Cutout (Pipe Chase)
K-106	Mirror Highlite Edge for Sink
K-440	Waste Trough with 2" deep removable basket
K-447	High Backsplash up to 18"
K-448	High Backsplash up to 13"
K-450	Extra Drainboard
K-451	Drainboard Corner Turn
K-452	Control Bracket 8" x 12"
K-452S	Splash Mounted Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-453S	Splash Mounted Control Bracket 14" x 16"
K-454	Sidesplash
K-456	Scrap Block Installed
K-460	Installation of Disposal Cone with 8" x 12" Control Bracket, Faucet Holes *(Cone supplied by others)*
K-460A	Installation of Disposal Cone with 14" x 16" Control Bracket, Faucet Holes *(Cone supplied by others)*

K-461	Install Collar with 8" x 12" control bracket *(Collar by others)*
K-461A	Install Collar with 14" x 16" control bracket *(Collar by others)*
K-470	Modify Bowl Depth
K-472	Faucet Hole Revision
K-473	Working Height Revision
K-476	Punch for Over Flow Holes *(Holes Only. N/C when ordering K-15)*
K-479	Undershelf Under Drainboard
K-480	Stainless Steel 12" Wide Shelf *(min. of 3 ft.)*
K-480A	Stainless Steel 15" Wide Shelf *(min. of 3 ft.)*
K-490	Provision for Pot Washer *(For "Wells-PW-106" only)*
K-491	Provision for Hatco Heater
K-495	Turn Down Backsplash *(Includes 2 Brackets. See K-397 Addt'l Sets)*
K-498	Tubular Overshelf 12" wide (Min. 3 Ft.)
K-499	Stainless Steel Pot Rack
K-500	Stainless Steel Apron to Cover Sink Bowls
K-500A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
K-508	Special Sizing Charge (Larger size cut down to smaller size
K-508A	Special Modification Charge
K-510	Prepare Sink for Undercounter Dishwasher *(24" drainboard or larger)*
K-520	Poly Board/Stainless Steel Cover Holder
K-550	Stainless Steel Tubular Rack Storage
K-ROD	Weld Support Rods For Poly Sink Cover In Corners Of Sink Bowl

ACCESSORIES

K-30	Faucet Wall Mounting Bracket
K-72	Leg To Wall Brace
K-350	Residential Finish & Packaging
K-397	Wall Brackets for Sink *(Brackets Included with K-495)*
K-457	Replacement Rubber Scrap Block *(See K-456 for install cost)*
K-474	16 ga., '304' Series S/S Leg with S/S Foot
K-475	S/S Legs with S/S Foot
K-477	Replacement Leg Clamp For Adjustable Cross-Bracing
K-477C	Replacement Corner Leg Clamp For Adjustable Cross-Bracing
K-478	Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-493	16 ga., '304' Series S/S Welded Leg Assembly with S/S Feet
K-494	S/S Welded Leg Assembly with S/S Feet
K-497	Galv. Welded Leg Assembly with Plastic Feet
K-497A	Galv. Individual Legs with Plastic Feet
K-496	Leg Assembly For Grease Interceptor w/ Adj. Cross-Bracing & S/S Feet *(For Grease Interceptors with 15" Ht. or less. Consult factory for larger Grease Interceptors)*
K-610	Perforated Stainless Steel Sink Grid *(Specify Bowl Size)*

SINK COVERS

Choose Model # & Add The Proper Letter In Place Of The Underscore (_).
Example: K-2A or FC-455H

	FOR DEEP DRAWN BOWLS		FOR FABRICATED BOWLS	
Bowl Size	**Poly Covers Model K-2_**	**S/S Covers Model K-455_**	**Poly Covers Model K-2_**	**S/S Covers Model FC-455_**
10" x 14"	A	A	AF	A
12" x 20"	I	I	IF	I
14" x 14"	H	H	HF	H
14" x 16"	B	B	BF	B
15" x 15"	Not Available	Not Available	MF	M
15" x 24"	Not Available	Not Available	UF	U
16" x 20"	C	C	CF	C
18" x 18"	Not Available	Not Available	JF	J
18" x 24"	D	D	DF	D
20" x 20"	E	E	EF	E
20" x 24"	Not Available	Not Available	PF	P
20" x 28"	G	G	GF	G
20" x 30"	Not Available	Not Available	SF	S
24" x 30"	Not Available	Not Available	TF	T
24" x 24"	F	F	FF	F
24" x 36"	Not Available	Not Available	RF	R
30" x 30"	Not Available	Not Available	VF	V

Custom Covers Available. Consult Factory.

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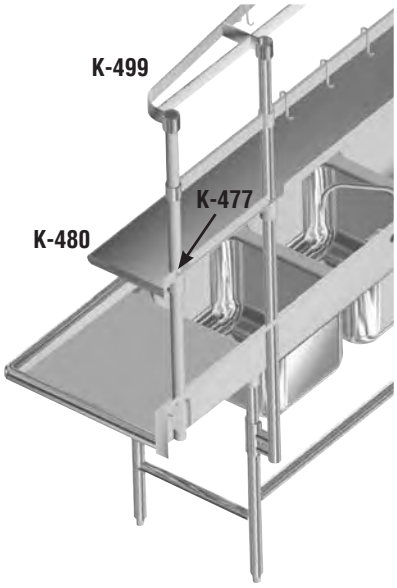
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11 40 01-280

POT RACK & TUBULAR OVERSHELF DETAILS AND SPECIFICATIONS

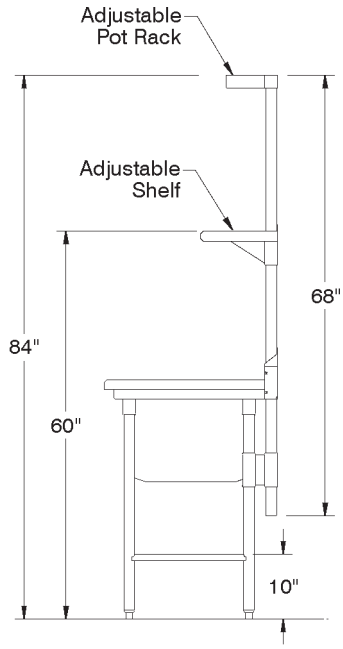
ADJUSTABLE POT RACK & SHELF



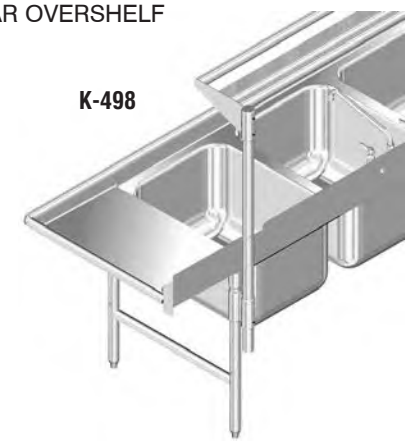
Item #: _____ Qty #: _____

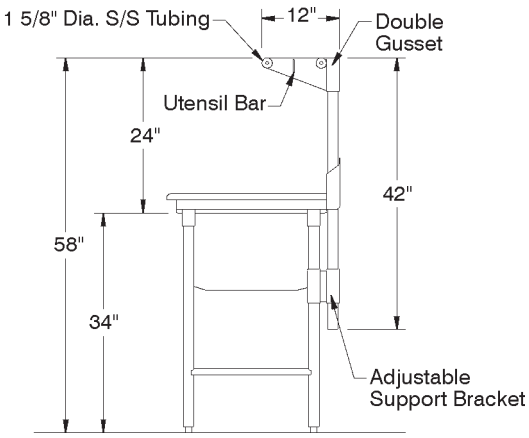
Model #: _____

Project #: _____

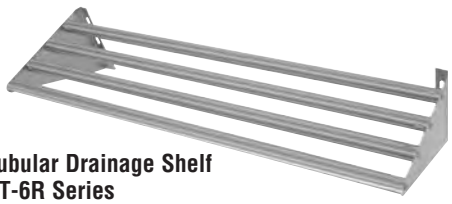


TUBULAR OVERSHELF





Model #	Description	Qty
K-477	Mounting Provision for Sink Mounted Pot Rack or Shelf	
K-480	12" Wide Stainless Steel Shelf	
K-498	Tubular Overshelf (min. 3 ft.)	
K-499	Stainless Steel Pot Rack	
DT-6R-36	3' Tubular Wall Mounted Drainage Shelf	
DT-6R-48	4' Tubular Wall Mounted Drainage Shelf	
DT-6R-60	5' Tubular Wall Mounted Drainage Shelf	
DT-6R-72	6' Tubular Wall Mounted Drainage Shelf	



Tubular Drainage Shelf
DT-6R Series

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SMART FABRICATION™

DISHTABLE RACK SHELVES

11 40 01-28.F

Mounts to backsplash and end roll of dishtable

Item #: _____ Qty #: _____
Model #: _____
Project #: _____

DTA-79

TABLE MOUNTED TUBULAR, DOUBLE SIDED DESIGN



Recommended for **D, G and U-Shaped** Series Dishtables Only.



OPTION 1: Lower Angle
(Racks cannot be back to back)



OPTION 2: Higher Angle
For back to back storage
(For maximum rack storage)

FEATURES:
A dual purpose double sided open tubular design table mounted rack shelf with solid end plates

CONSTRUCTION:
Stainless steel posts, cross-tubes & end plates
Mounts to dishtable with stainless steel bolts. Ships Knocked Down*
Easily assembles with simple tool

MATERIAL:
End Plates are 14 gauge type 304 series stainless steel
Tubing is 1 5/8" diameter 18 gauge type 300 stainless steel tubing

*Shelf ships separately from table to reduce freight costs and chance of shipping damage. Entire unit may ship pre-assembled from factory where special applications exist. Consult factory.

Per Linear Foot. Minimum Length 48"

When using DTA-79 as a Pass-Thru for a glass rack, use **OPTION 2** (see above).

This will allow the rack to pass through the middle (10" Clearance).

OPTIONAL
12" Wide Solid Overshelf
Model # DTA-80

Mounts above DTA-79
(Quantity must be equal to the length of DTA-79)
Sold per linear foot



MODEL #	Qty.
DTA-79	

DTA-79S

TABLE MOUNTED, DOUBLE SIDED DESIGN WITH SOLID BASE



FEATURES:
Table mounted rack shelf with solid base & end plates.
Drip tubes for water drainage

CONSTRUCTION:
Stainless steel posts, cross-tube (at top along length) & end plates
Mounts to dishtable with stainless steel bolts. Ships Knocked Down*
Easily assembles with simple tool

MATERIAL:
End Plates and shelf base are 14 gauge type 304 series stainless steel
Tubing is 1 5/8" diameter 18 gauge type 300 stainless steel tubing

*Shelf ships separately from table to reduce freight costs and chance of shipping damage. Entire unit may ship pre-assembled from factory where special applications exist. Consult factory.

Per Linear Foot. Minimum Length 48"

OPTIONAL
12" Wide Solid Overshelf
Model # DTA-80

Mounts above DTA-79
(Quantity must be equal to the length of DTA-79)
Sold per linear foot

MODEL #	Qty.
DTA-79S	

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325 Wireless Boulevard, Hauppauge, NY 11788

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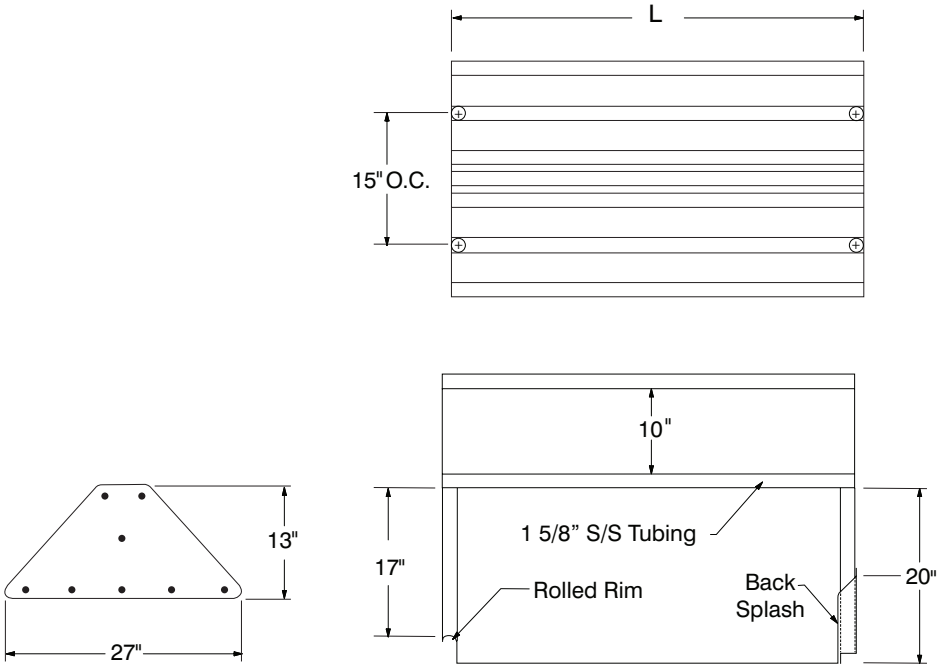
DIMENSIONS and SPECIFICATIONS

11-45-01-282

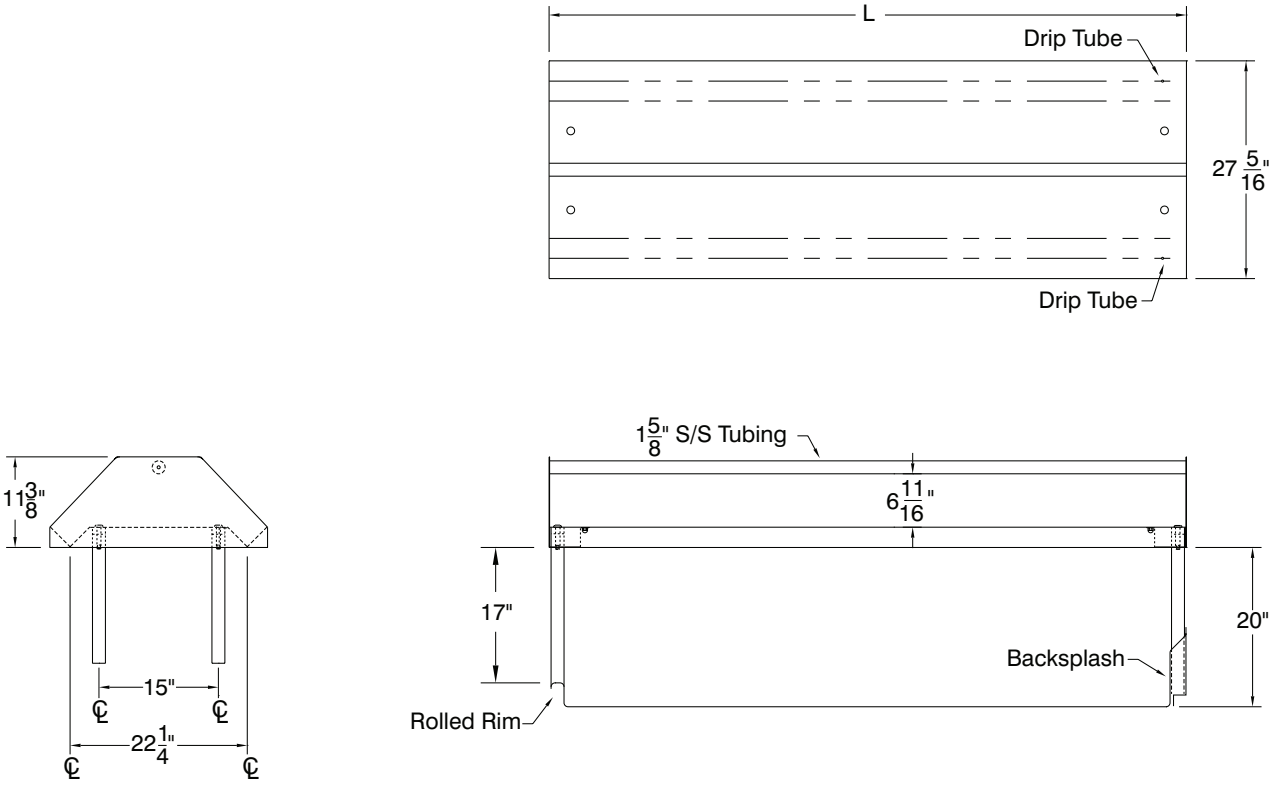
TOL ± .125”

ALL DIMENSIONS ARE TYPICAL

DTA-79



DTA-79S



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325 Wireless Boulevard, Hauppauge, NY 11788

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11 40 01-283

Submittal Sheet

09/15/2026

ITEM# 2.31 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-284

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-285

Submittal Sheet

09/15/2026

ITEM# 2.32 - SWING FAUCET, 12" (2 EA REQ'D)

T&S Brass B-0290-04

Big-Flo Mixing Faucet, wall mount, 8" adjustable centers, 12" swing nozzle with plain end outlet, 4" wrist handles with color coded indexes, low-lead, 3/4" female NPT, ANSI, NSF, ADA Compliant

T&S BRASS AND BRONZE WORKS, INC.
2 Saddleback Cove / P.O. Box 1088
Travelers Rest, SC 29690
Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

11.40.DN.386

Model No.
B-0290-04

Item No.

ADA Compliant

This Space for Architect/Engineer Approval

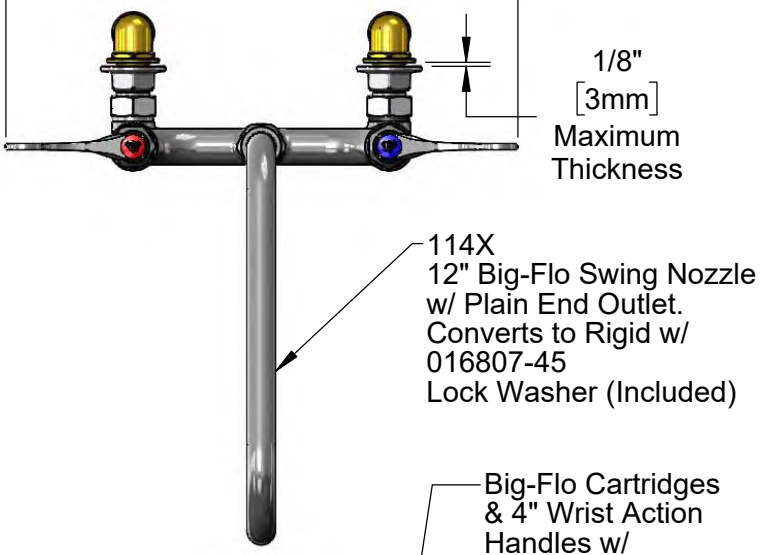
Job Name_____Date_____

Model Specified_____ Quantity_____

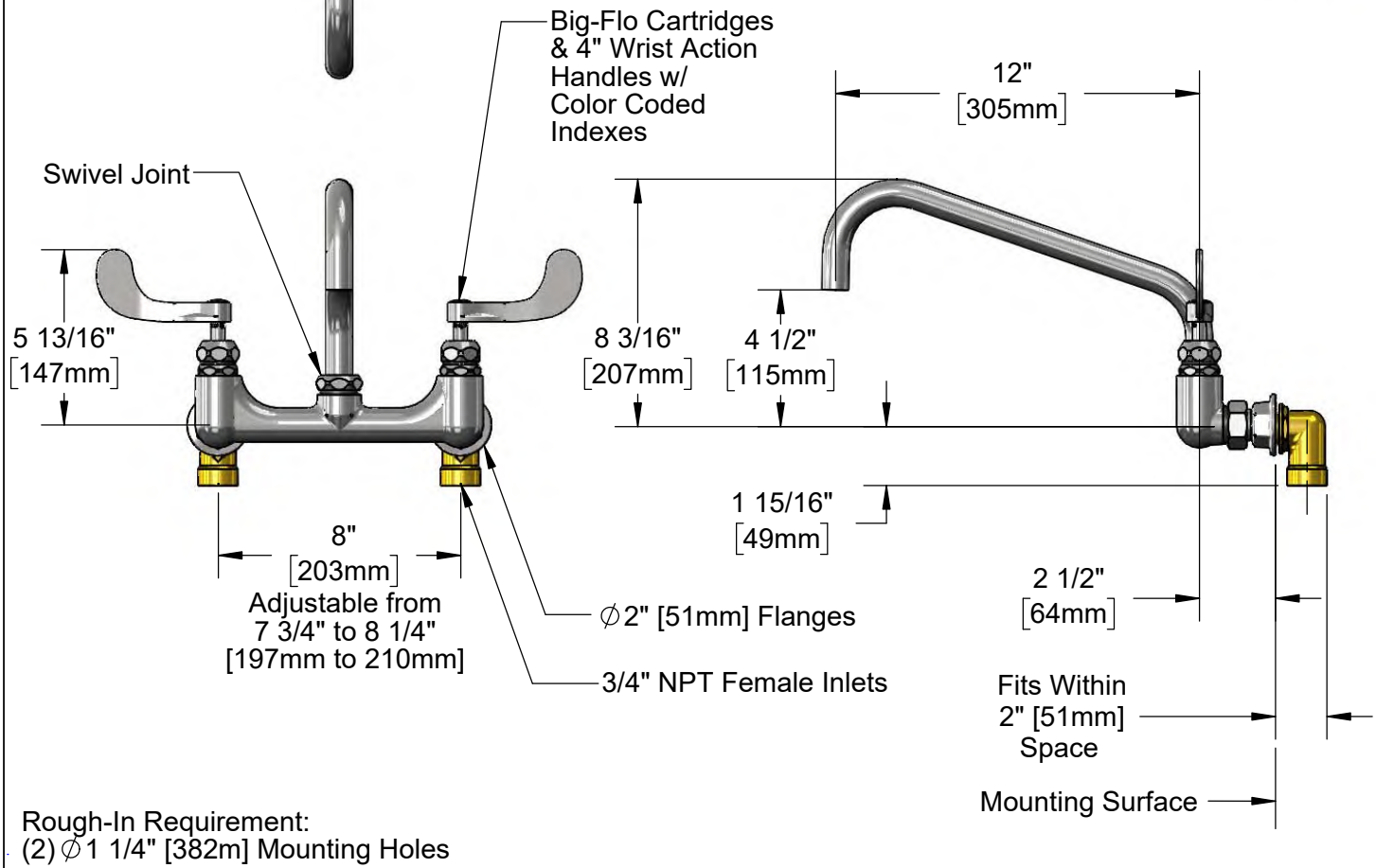
Customer/Wholesaler_____

Contractor_____

Architect/Engineer_____







Rough-In Requirement:
(2) ∅1 1/4" [382m] Mounting Holes

Product Specifications:
8" Wall Mount Big-Flo Mixing Faucet, Big-Flo Cartridges, 4" Wrist Action Handles,12" Big-Flo Swing Nozzle & 3/4" NPT Female Inlets

Product Compliance:
ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
ANSI A117.1 (ADA)

Drawn: MRC	Checked: JRM	Approved: JHB	Date: 06/15/18	Scale: 1:6	Sheet: 1 of 2

T&S BRASS AND BRONZE WORKS, INC.

2 Saddleback Cove / P.O. Box 1088
Travelers Rest, SC 29690

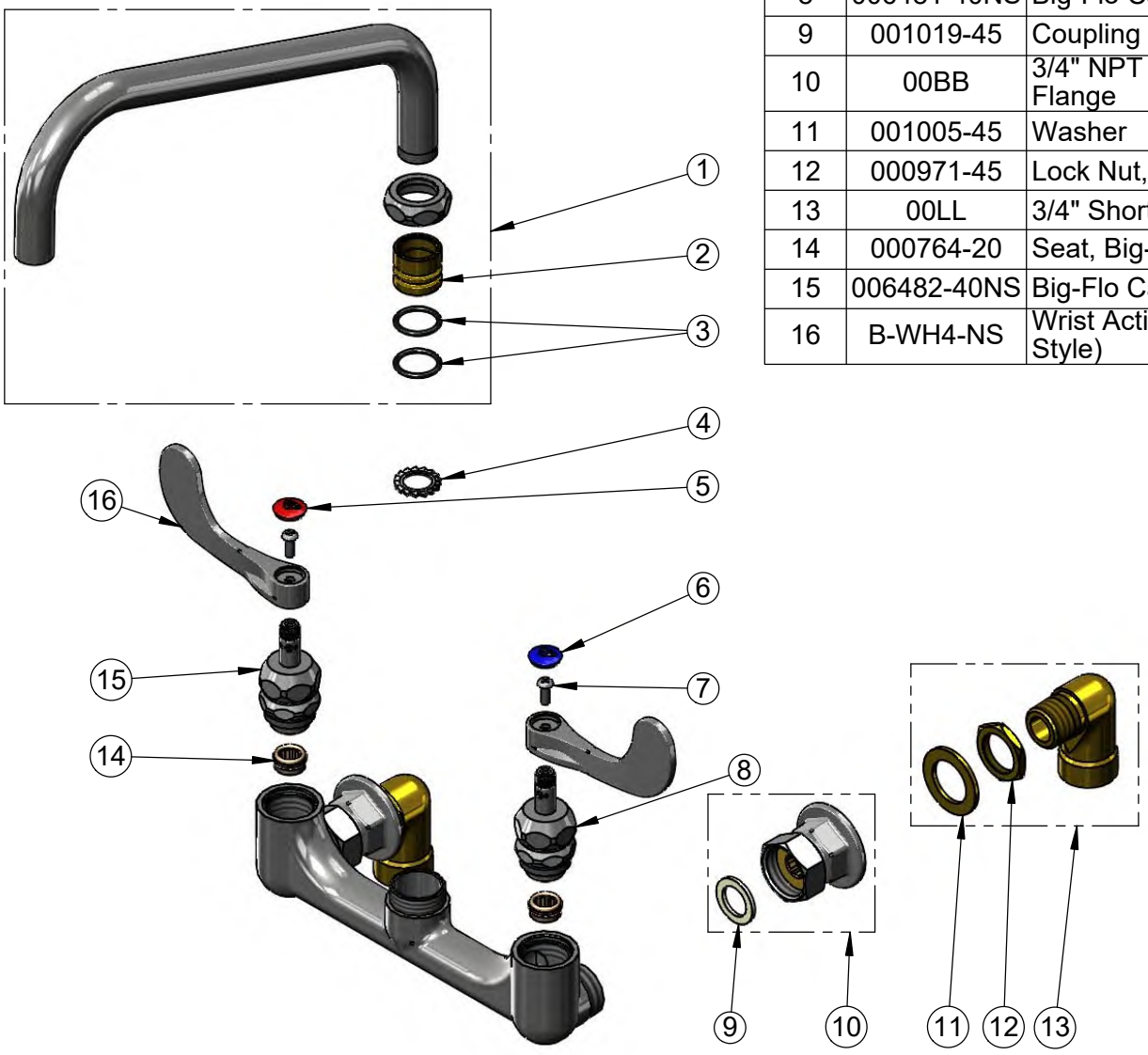
Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

M 40 DN 287

Model No.: **B-0290-04**

Item No.

ITEM NO.	SALES NO.	DESCRIPTION
1	114X	12" Big-Flo Swing Nozzle
2	000847-20	Big-Flo Swivel Piece
3	001068-45	O-ring
4	016807-45	Serrated Lock Washer
5	001193-19NS	Red Button Index, Press-in
6	018506-19NS	Blue Button Index, Press-in
7	000925-45	Lab Handle Screw
8	006481-40NS	Big-Flo Cartridge, LTC
9	001019-45	Coupling Nut Washer
10	00BB	3/4" NPT Female Eccentric Flange
11	001005-45	Washer
12	000971-45	Lock Nut, 3/4-14 NPSM
13	00LL	3/4" Short Elbow Inlet
14	000764-20	Seat, Big-Flo
15	006482-40NS	Big-Flo Cartridge, RTC
16	B-WH4-NS	Wrist Action Handle (New Style)



Product Specifications:

8" Wall Mount Big-Flo Mixing Faucet, Big-Flo Cartridges, 4" Wrist Action Handles,12" Big-Flo Swing Nozzle & 3/4" NPT Female Inlets

Product Compliance:

ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
ANSI A117.1 (ADA)

Drawn:	MRC	Checked:	JRM	Approved:	JHB	Date:	06/15/18	Scale:	NTS	Sheet:	2 of 2

11 40 01-288

Submittal Sheet

09/15/2026

ITEM# 2.33 - POT RACK (1 EA REQ'D)

Advance Tabco SW1-48

Pot Rack, wall-mounted, single bar design, 48" long, with 6 plated double hooks, constructed of 1/4" x 2" stainless steel

11 40 01-289

SINGLE BAR POT RACKS

Item #: _____ Qty #: _____
Model #: _____
Project #: _____



SW1-36 Series Shown

Stainless Steel



GW1-36 Series Shown

Powder Coated

FEATURES:

Wall mounted single bar Pot Rack.

MATERIAL:

Flat steel bar is 2" x 1/4", stainless steel.

Pot hooks are double prong plated. (6-9 per unit)

CONSTRUCTION:

All welded stainless steel units are blended to a satin finish.
All powder coated units are coated with FDA approved material.
Aluminum is die formed from single piece.

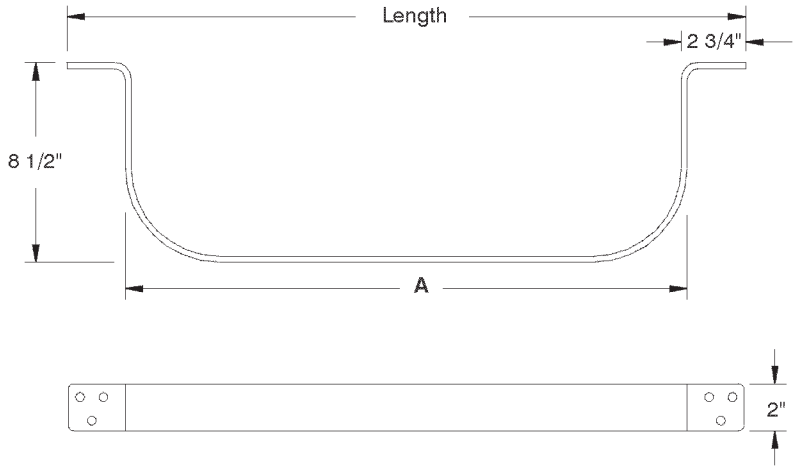
Length	A	S/S	Wt.	# of Hooks
29"	24"			6
41"	36"	**SW1-36**	13 lbs.	6
53"	48"	**SW1-48**	15 lbs.	6
65"	60"	**SW1-60**	17 lbs.	9
77"	72"	**SW1-72**	19 lbs.	9
89"	84"	**SW1-84**	21 lbs.	9
101"	96"	**SW1-96**	23 lbs.	9
113"	108"	**SW1-108**	25 lbs.	9
125"	120"	**SW1-120**	27 lbs.	9

Units 7 ft. and larger are furnished with three (3) sets of brackets.

DETAILS and SPECIFICATIONS

TOL ± .500"

ALL DIMENSIONS ARE TYPICAL



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11 40 01-290

Submittal Sheet

09/15/2026

ITEM# 2.34 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-291

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-292

Submittal Sheet

09/15/2026

ITEM# 2.35 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-293

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-294

Submittal Sheet

09/15/2026

ITEM# 2.36 - WAREWASHER, CONVEYOR (1 EA REQ'D)

MEIKO KA-66

KA Series Rack Conveyor Dishwasher, high temperature sanitizing, 66" / 1676mm single-tank design with prewash, 243 racks/hour capacity, 0.29 gallons/1.11 liters per rack, fully automatic operation, glass touch-panel display with graphical and text displays, 3 selectable conveyor speeds, deliming mode, blue color coding for frequently-cleaned components, 3 hp / wash pump, double wall top, front and rear panels, stainless steel construction, hinged front door with sealing gasket, vent cowlings, connection for external vent fan control, detergent and rinse aid connections, electric tank heat, built-in electric booster heater, PRV, NSF listed, cETLus listed, ENERGY STAR®

ACCESSORIES

Mfr	Qty	Model	Spec
MEIKO	1		Left to right operation
MEIKO	1		Internal booster heater included, standard
MEIKO	1		Drain water tempering kit, reduces drain water temperature to below 140°F (60°C), installation by others
MEIKO	1		Table limit switch with 25' (7.6m) cable

KA-66

Hot Water Sanitizing
Single-Tank
Rack-Conveyor Dishwasher

11 40 01-295

MEIKO
The clean solution

Special features:

- **Low water consumption** of 71 gallons (268.8 liters) per hour, 0.29 gallons (1.11 liters) per rack.
- **NSF rated 243 racks per hour.**
- **Glass touch screen control panel** for fully automatic operation and advanced service diagnostics. Messages are displayed in plain text, with a selection of multiple languages including English, Spanish and French.
- **Built-in "smart" booster heater** ensures correct sanitizing temperature of 180°/82°C (incoming water temperature of 110°-140°F/43°- 60°C).
- "**Blue cues" color coding** of components to be touched during daily cleaning makes cleaning intuitive.
- **Modular construction** reduces lead times. Ships as a single unit.

Standard features:

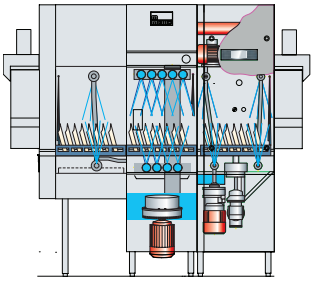
- 3 drive speeds: Wash 243, 202 or 162 racks/hour.
- 304-series stainless steel construction.
- Uniquely-designed center-drive pawl system eliminates water spray blockage from below the rack, while providing reliable operation.
- Double-wall insulated construction on front, top and back to improve operator safety, conserve heating energy, and reduce noise and heat loss into the dishroom.
- Standard vent cowls with collars.
- Sealed, hinged access door(s) are field-reversible by an Authorized Service Agent.
- Stainless steel wash arms are optimally positioned and easily removable for cleaning. Wash arm end caps are cooler to the touch for safety. Nozzles are slotted and concave to minimize clogging.
- Powerful 3hp (2.2 kW) wash pump provides outstanding cleaning results. Pump motor is vertically-mounted for easy servicing.
- Detergent and rinse aid access ports.
- Single-point drain connection.
- Low-level heater protection.
- Potential-free contacts for external vent fan control.

Specifications:

KA-66: (1,118 mm) compartment with wash and final rinse zones. 22" (559 mm) prewash section. Table-to-table length 66" (1,676 mm). Length with hoods 75-3/8" (1,872 mm).



Note: Tabling sold by other manufacturers.



KA-66

TABLE-TO-TABLE DIMENSIONS:
66"L x 76-1/8"H x 31-1/4"D
(1,676 mm x 1,934 mm x 795 mm).

DIMENSIONS WITH HOODS:
75-3/8"L x 76-1/8"H x 31-1/4"D
(1,872 mm x 1,934 mm x 795 mm).

Options:

- Waste Air Heat Recovery System (WAHRS): Requires incoming water temperature less than 110°F (43°C). Cold water supply or below 68°F (20°C) recommended.
- Blower dryer improves drying of dishes, glassware, crockery and silverware. Adds 23 5/8" (600mm) to machine length.
- The industry's first 90° mechanical unloader/blower dryer module.
- 90° mechanical loader and unloader (unhooded).
- Single point electrical connection available. Contact factory for more information.
- Water hammer arrestor.
- Machine separations for ease of handling and installation, contact factory.
- Contact factory for drawings including options.

Accessories:

- Table limit switch.
- Drain water tempering kit.
- Open-ended sheet pan rack.
- Flanged feet.

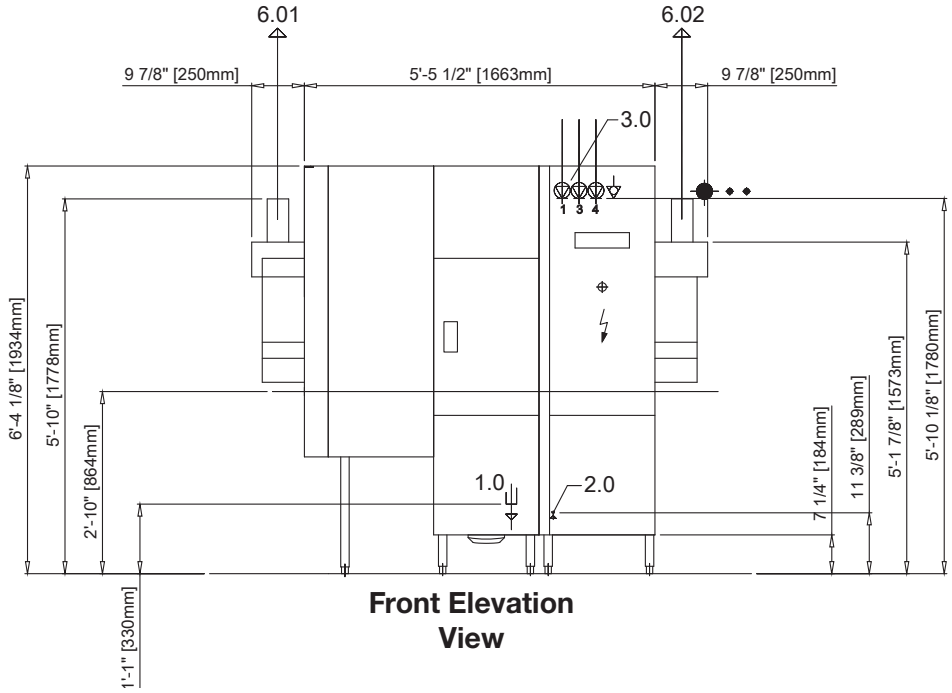
This dishwasher is compliant with the Reduction of Lead in Drinking Water Act (2011) amendment to the Safe Drinking Water Act (SDWA).

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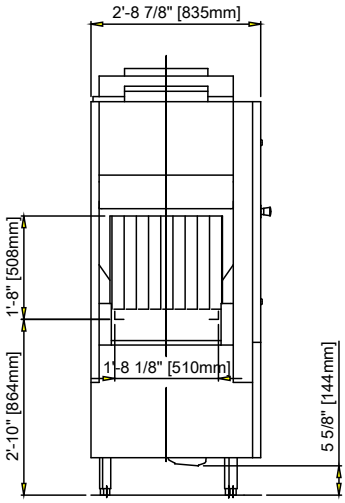
KA-66, Left to right - electric heat

11 40 01-296

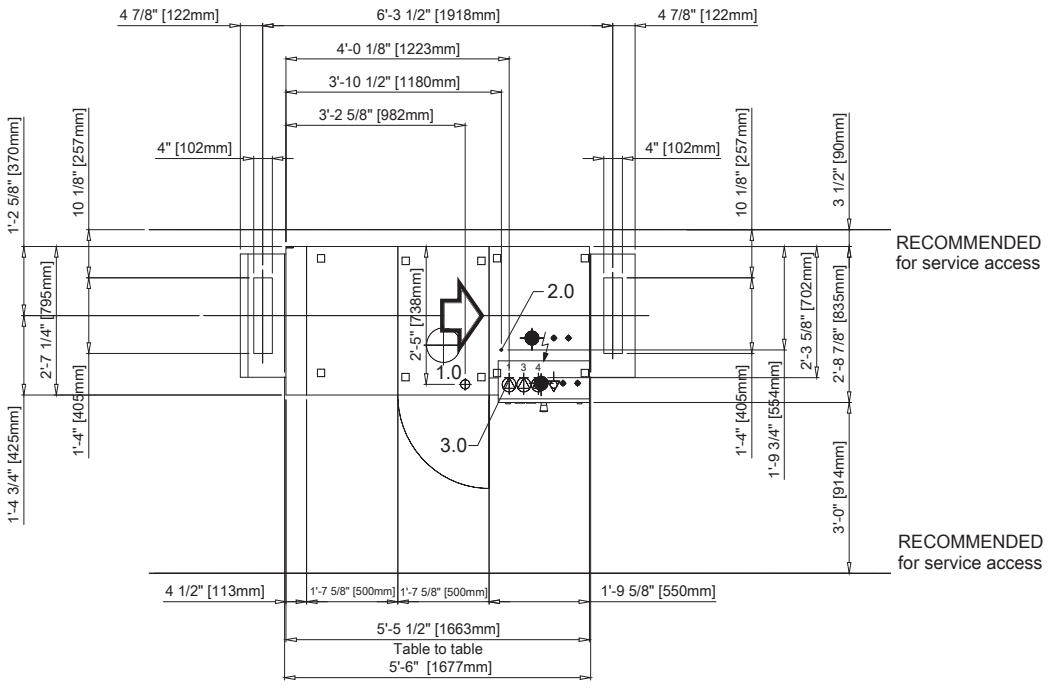
Review the Utility Connections and Technical Specif cations pages for additional details.	
1.0 Drain	2.02 Cold water connection (with WAHRS option)
2.0 Warm water connection (without WAHRS)	3.0 Electrical connections
2.01 Warm water connection (with WAHRS)	6.01 Vent connection
	6.02 Vent connection



Front Elevation View



Side Elevation View

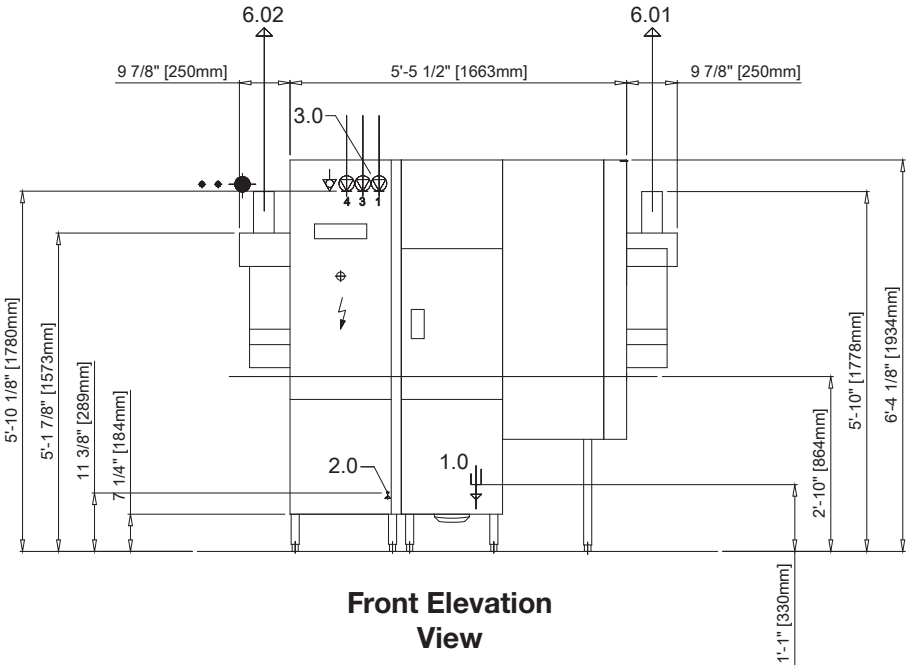


Plan View

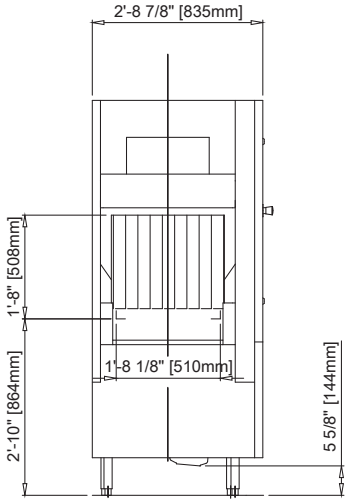
11 40 01-297

KA-66, Right to left - electric heat

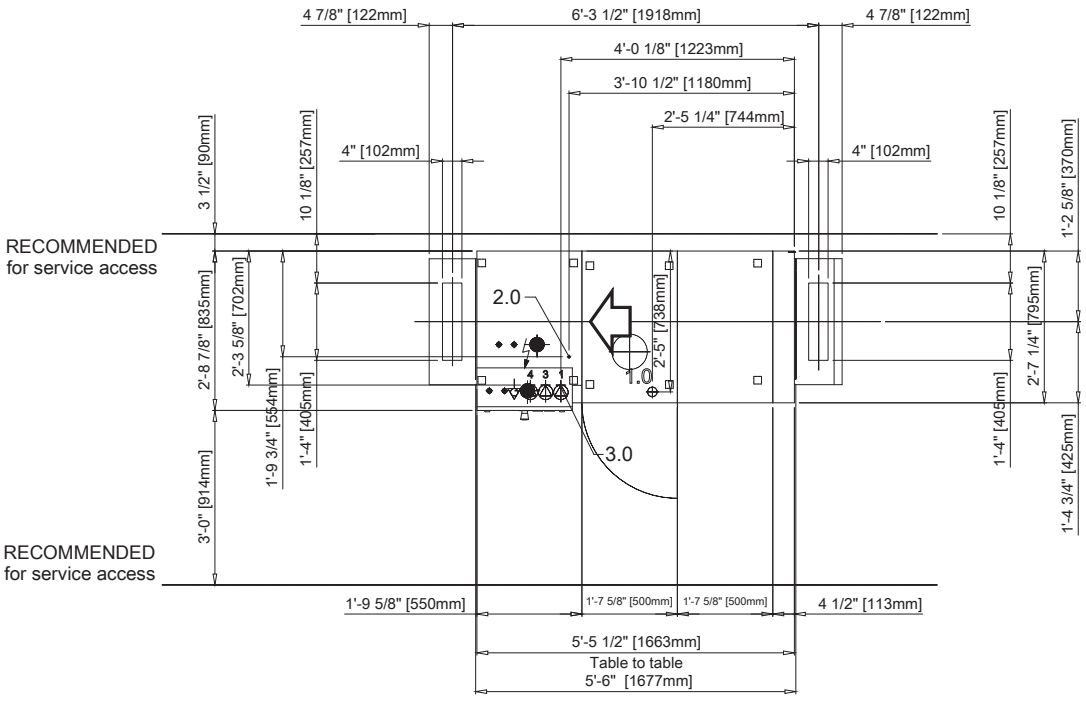
Review the Utility Connections and Technical Specif cations pages for additional details.	
1.0 Drain	2.02 Cold water connection (with WAHRS option)
2.0 Warm water connection (without WAHRS)	3.0 Electrical connections
2.01 Warm water connection (with WAHRS)	6.01 Vent connection
	6.02 Vent connection



Front Elevation View



Side Elevation View



Plan View

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KA-66 Utility Connections Detail Page

11 40 01-298

1.0 Drain

- Vertical, gravity-fed drain outlet (HDPE piping). 2" OD or 1½" pipe via no-hub required for connection.
- Connection pipe work and P-trap to be provided by others (HDPE piping).
- Additional piping to drain (if required) to be provided by others.
- Connection is 13" (330 mm) AFF.
- NOTE: Drain locations may vary.

2.0 Warm water connection (final rinse); machines without WAHRS option:

- ¾" NPT pipe connection.
- Temperature: 110° - 140°F (43° - 63°C).
- Initial fill: **KA-66** = 21.1 gallons (80 liters)
- Consumption = 71 gallons (268.8 liters) per hour.
- Recommended hardness = 1-3 grains/gallon.
- Connection = 11" (279 mm) AFF.

2.01 Warm water connection (final rinse); machines with WAHRS option:

- 1/2" NPT pipe connection.
- Temperature: 110° - 140°F (43° - 60°C).
- Initial fill: **KA-66** = 21.1 gallons (80 liters)
- Recommended hardness = 1-3 grains/gallon.
- Connection = 11" (279 mm) AFF.

2.02 Cold water connection (final rinse); machines with WAHRS option:

- 1/2" NPT pipe connection.
- Temperature as cold as available: 53°- 68°F (12°- 20°C) recommended.
- Consumption = 71 gallons (268.8 liters) per hour.
- Recommended hardness = 1-3 grains/gallon.
- Connection = 11" (279 mm) AFF.

Equipotential ground lug

3.0 Electrical connections

Values in Amps: 208V/60Hz/3Ph

Model	TB1	TB2	TB3	TB4	TOTAL
KA-66	57.3		50.0	3.9	111.2
Breaker	80.0		70.0	15.0	
with dryer added				16.2	123.5
Breaker				25.0	
with WAHRS added			70.0		131.2
Breaker			90.0		
with both added					143.5

Values in Amps: 230V/60Hz/3Ph

Model	TB1	TB2	TB3	TB4	TOTAL
KA-66	55.1		45.2	3.9	104.2
Breaker	70.0		60.0	15.0	
with dryer added				17.3	117.6
Breaker				25.0	
with WAHRS added			63.3		122.3
Breaker			80.0		
with both added					135.7

Values in Amps: 460V/60Hz/3Ph

Model	TB1	TB2	TB3	TB4	TOTAL
KA-66	29.9			22.6	52.5
Breaker	40.0			30.0	
with dryer added	39.3				61.9
Breaker	50.0				
with WAHRS added				31.6	61.5
Breaker				40.0	
with both added					70.9

Heat values in kW

Latent	Perceptible	Total
3.4	2.8	6.2

6.01 Load-end vent connection:

- See Detail View on Technical Specifcations page
- 200 CFM [340 m‡/hr]

6.01 Load-end vent connection with WAHRS option:

- See Detail View on Technical Specifcations page
- 200 CFM [340 m‡/hr]
- Connection must be corrosion-resistant and frost-free. In particular, provisions must be made to prevent air temperatures of 32°F (0°C) or colder from reaching the machine at any time. A provision for draining moisture from the waste air pipe (condensate return) is strongly recommended.

6.02 Unload vent connection:

- See Detail View on Technical Speci cations page
- 400 CFM [680 m³/hr]

Note:

- Relative humidity: approximately 98%.
- Machine exhaust (pant leg connection) recommended as per values listed above.
- Machine exhaust hood connection (by tohers): recommended 100 CFM [170 m³/hr] per lineal foot of hood. Length of hood contingent on machine model and local site conditions at time of installation. MEIKO assumes no responsibility.
  - 18" hood overhang to front of machine.
  - 36" hood overhang on load and unload ends.

KA-66 Technical Specif cations Detail Page

11 40 01-299

Specified dishwasher will be KA-66 high-temp rack conveyor. Low water consumption of 0.29 gallons/rack. NSF rated 243 racks/hour. Blue cues help operators locate important components for cleaning. Touchscreen control panel with advanced diagnostics. 3 conveyor speeds. Stainless steel construction with double wall insulation, plus a built-in booster heater. 20” chamber height accommodates standard-sized sheet pans with an open-ended dish rack. NSF/UL/ES rated.

Performance

Maximum rack capacity/hour	243/202/162
Water consumption *(maximum)*	71 gal/hr (268.8 liters)
Water consumption/rack	0.29 gal/rack (1.1 liters)

Venting data pant leg

Load end:	200 CFM/340m³/h
Unload end:	400 CFM/680m³/h
Total:	600 CFM /1,020m³/h
Relative humidity *(approx.)*:	98%

Dimensions

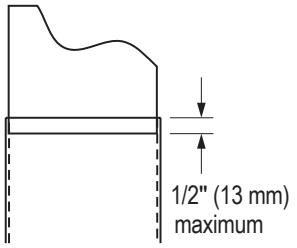
KA-66 length, table-to-table	66" (1,676 mm)
Length, blower dryer *(option)*	+ 23⅝" (600 mm)
Height	76⅛" (1934 mm)
Depth	31¼" (795 mm)
Clearance height inside wash chamber	20" (508 mm)

Recommended Pant Leg Connection

Machines that are not placed underneath a ventilation hood require “pant leg” ventilation ducts. To determine the dimensions of the duct, first determine how they will be installed.

Duct sleeved inside collar (recommended):

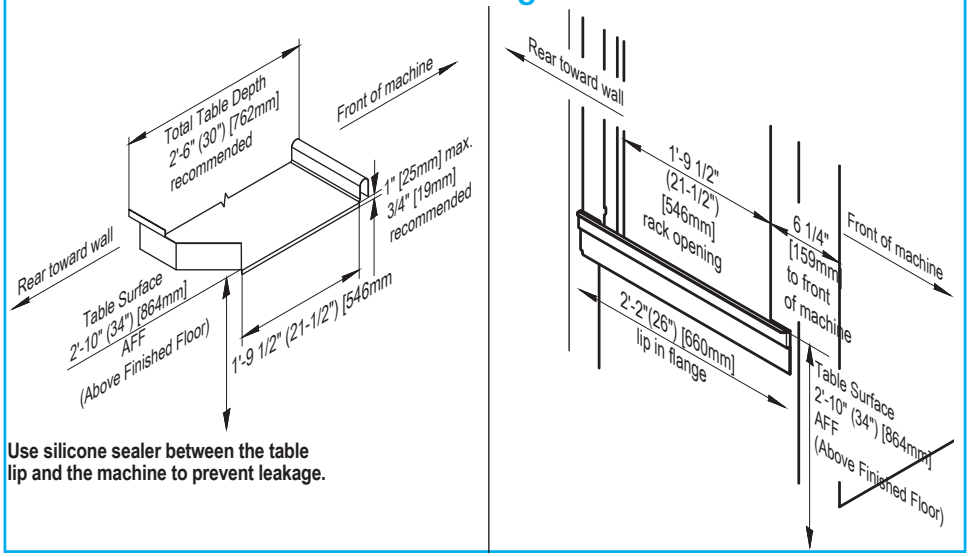
4" W x 16" D (102 x 406 mm) **inside dimensions**



Component data

Wash pump motor	3.0 hp (2.2 kW)
Prewash pump motor	3.0 hp (2.2 kW)
Conveyor drive motor	0.13 hp (0.12 kW)
Vent motor *(WAHRS option only)*	0.17 hp (0.13 kW)
Blower dryer motor *(blower dryer option only)*	0.67 hp (0.48 kW)

Recommended Tabling Construction



Note: *All specifications are subject to change without notice based on MEIKO’s dedicated product improvement program.*

23141 SUNY Faye Corey Student Union

Submittal Sheet

09/15/2026

ITEM# 2.36A - VENT DUCT, LOAD END (1 REQ'D)

Custom

Fabricated to fit the Load End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

Description: Vent Duct, Load End

Notes: Fabricated to fit the Load End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

Submittal Sheet

09/15/2026

ITEM# 2.36B - VENT DUCT, UNLOAD END (1 REQ'D)

Custom

Fabricated to fit the Unload End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

Description: Vent Duct, Unload End

Notes: Fabricated to fit the Unload End Vent Hood for Dishwasher Item 2.36
Refer to Detail V.2 on Sheet QF-206 for additional information

11 40 01-304

Submittal Sheet

09/15/2026

ITEM# 2.37 - CLEAN DISHTABLE (1 EA REQ'D)

Advance Tabco DTC-S70-84R

Dishtable, clean, straight design, attaches to right of dish machine operator, 10-1/2"H backsplash, 3" rolled front & side rims, stainless steel legs, with crossrails, 83"W x 30"D x 34"H, 16/304 stainless steel

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	DTA-75	Provision for limit switch (limit switch by others)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

DISHTABLES
CLEAN STRAIGHT

11 40 01-305

NEW *Tile Edge Design* NSF



DTC-S60-60R Shown
Optional Undershelf Shown

Item #: _____ ***Qty #:*** _____
Model #: _____
Project #: _____

Spec-Line: 14 ga. 304 Series Stainless Steel Top.
16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

UPGRADED!
Standard: 16 ga. 304 Series Stainless Steel Top.
16 ga. 304 Stainless Steel Legs Stainless Steel Legs with Welded Cross Bracing & Stainless Steel Bullet Feet.

Super Saver: 16 ga. 304 Series Stainless Steel Top.
Galvanized Legs with Plastic Bullet Feet.

FEATURES:

Tile edge for ease of installation.
Dishtable system consists of SOIL and CLEAN sections.
Table is furnished with 10-1/2" splash with a 2" return.

CONSTRUCTION:

All TIG welded.
Welded areas blended to match adjacent surfaces and to a satin finish.
Stainless Steel Gussets welded to a stainless steel support channel.

Optional Stainless Steel UNDERSHELF Die Cast LEG CLAMP
secured to shelf eliminates unsightly nuts & bolts



10-1/2"" EXTRA LARGE Bold Looking Backsplash with 2" return and tile edge



ACCESSORIES	Model #	Qty
Faucet		
Wall Shelf		
Undershelf		

Nominal sizing on all dishtables for ease of installation.

		14 Gauge 304 16 Ga. Stainless Steel Legs	16 Gauge 304 Stainless Steel Legs	16 Gauge 304 Galvanized Legs	
Nominal Size	"L"	SPEC-LINE	STANDARD	SUPER SAVER	Approx. Wt.
2 Ft.	23"	DTC-S30-24L or R	DTC-S70-24L or R	DTC-S60-24L or R	35 lbs.
3 Ft.	35"	DTC-S30-36L or R	DTC-S70-36L or R	DTC-S60-36L or R	45 lbs.
4 Ft.	47"	DTC-S30-48L or R	DTC-S70-48L or R	DTC-S60-48L or R	60 lbs.
5 Ft.	59"	DTC-S30-60L or R	DTC-S70-60L or R	DTC-S60-60L or R	70 lbs.
6 Ft.	71"	DTC-S30-72L or R	DTC-S70-72L or R	DTC-S60-72L or R	85 lbs.
7 Ft.	83"	DTC-S30-84L or R	DTC-S70-84L or R	DTC-S60-84L or R	100 lbs.
8 Ft.	95"	DTC-S30-96L or R	DTC-S70-96L or R	DTC-S60-96L or R	110 lbs.
9 FT.	107"	DTC-S30-108L or R	DTC-S70-108L or R	DTC-S60-108L or R	225 lbs.
10 Ft.	119"	DTC-S30-120L or R	DTC-S70-120L or R	DTC-S60-120L or R	250 lbs.
12 Ft.	143"	DTC-S30-144L or R	DTC-S70-144L or R	DTC-S60-144L or R	260 lbs.

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NEVADA Fax: (775) 972-1578

DIMENSIONS and SPECIFICATIONS

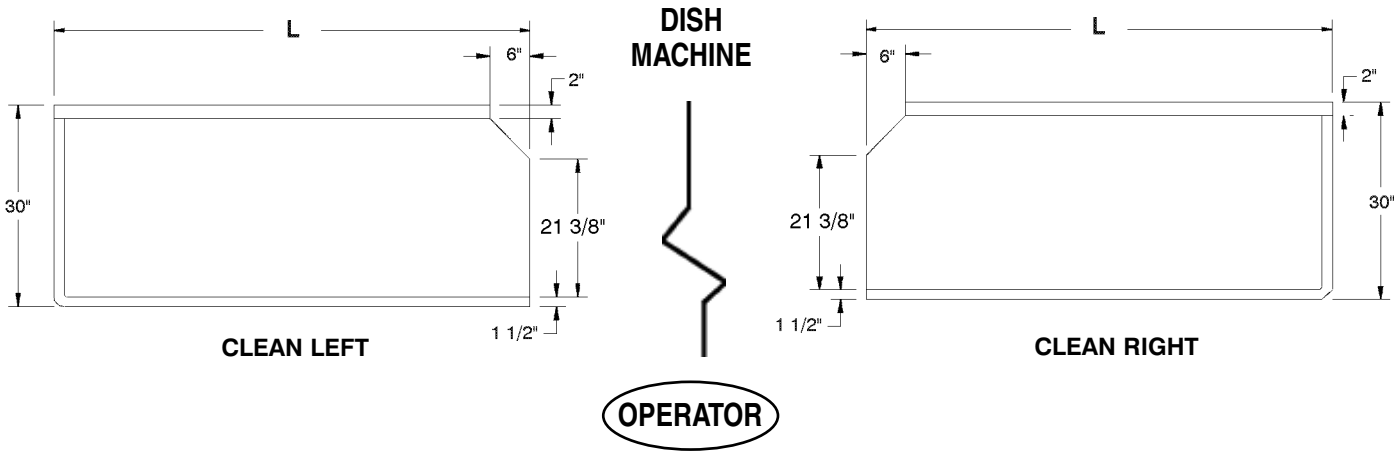
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TOL ± .500”

ALL DIMENSIONS ARE TYPICAL

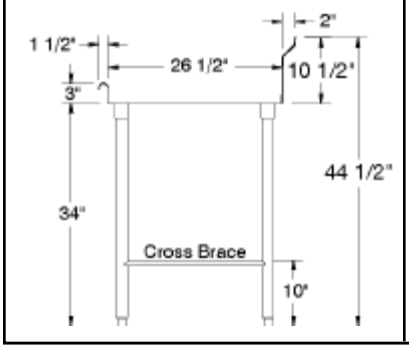
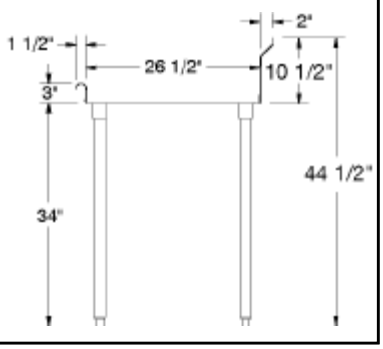
SEE DISH MACHINE COMPATIBILITY CHART TO ENSURE PROPER FIT

Dish Machine Compatibility Chart can be found on our website at www.advancetabco.com under “Product Support”



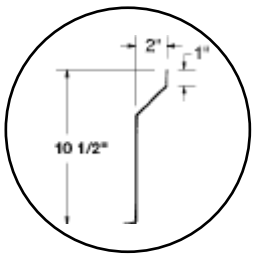
CLEAN LEFT **CLEAN RIGHT**

OPERATOR

SPEC-LINE & STANDARD	SUPER SAVER
	

CUSTOMIZE YOUR OWN SYSTEM
by Ordering Optional Accessories from our
PRODUCT & PRICE GUIDE

Splash Detail



Description	SPEC-LINE	STANDARD	SUPER SAVER
Material	**14 Ga. 304 Series**	**16 Ga. 304 Series**	**16 Ga. 304 Series**
1 5/8” Dia. Legs	Stainless Steel	Stainless Steel	Galvanized
Gussets	Stainless Steel	Stainless Steel	Stainless Steel
Bullet Feet (1” adj.)	Stainless Steel	Stainless Steel	Plastic
Cross Bracing	Welded	Welded	Optional

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ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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11 40 01-307

Dishtable Modifications & Accessories



DTA-95



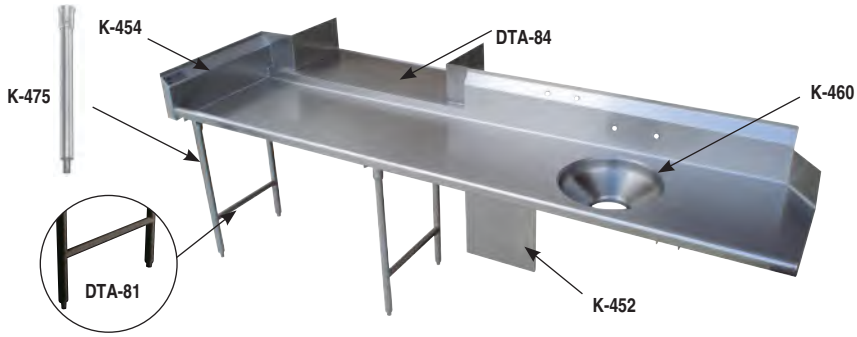
DTA-87



DTA-82



DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

⚠ WARNING: 11 40 01-308
Faucet(s) on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

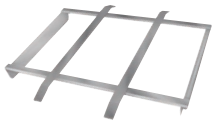
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



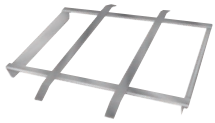
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets
T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5


Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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11 40 01-309

Submittal Sheet

09/15/2026

ITEM# 2.38 - PRE-RINSE FAUCET (1 EA REQ'D)

T&S Brass B-0133-01

EasyInstall Pre-Rinse Unit, mixing faucet, 8" wall mount, 14" add-on 063X swing nozzle, 18" riser, overhead spring, lever handles, 56" flex hose, Eterna cartridges, spray valve (B-0107), 9" wall support (B-0109-02), 1/2" male NPT, EPAct2005 Compliant

T&S BRASS AND BRONZE WORKS, INC.

2 Saddleback Cove / P.O. Box 1088
Travelers Rest, SC 29690

Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

11.40.01.310

Model No.
B-0133-01

Item No.

This Space for Architect/Engineer Approval

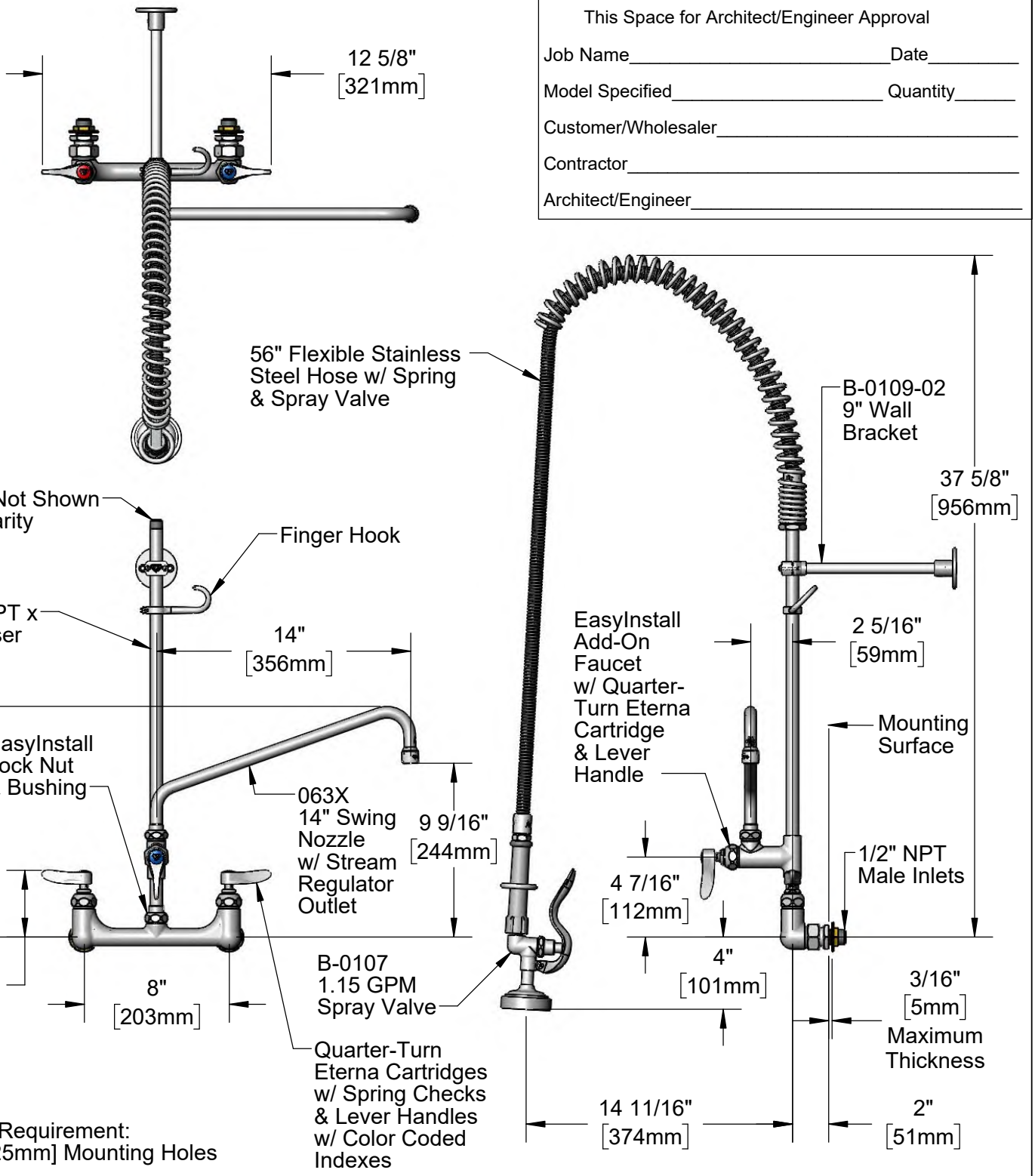
Job Name_____Date_____

Model Specified_____ Quantity_____

Customer/Wholesaler_____

Contractor_____

Architect/Engineer_____



Product Specifications:

Pre-Rinse Unit: EasyInstall 8" Wall Mount Mixing Faucet, Quarter-Turn Eterna Cartridges w/ Spring Checks, Lever Handles, Add-On Faucet, 14" Swing Nozzle, 56" Flexible Stainless Steel Hose, 1.15 GPM Spray Valve, 9" Wall Bracket & 1/2" NPT Male Inlets

Product Compliance:

ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
2019 DOE PRSV - Class II

Drawn:	LSA	Checked:	KJG	Approved:	JHB	Date:	03/03/20	Scale:	1:8	Sheet:	1 of 2

T&S BRASS AND BRONZE WORKS, INC.

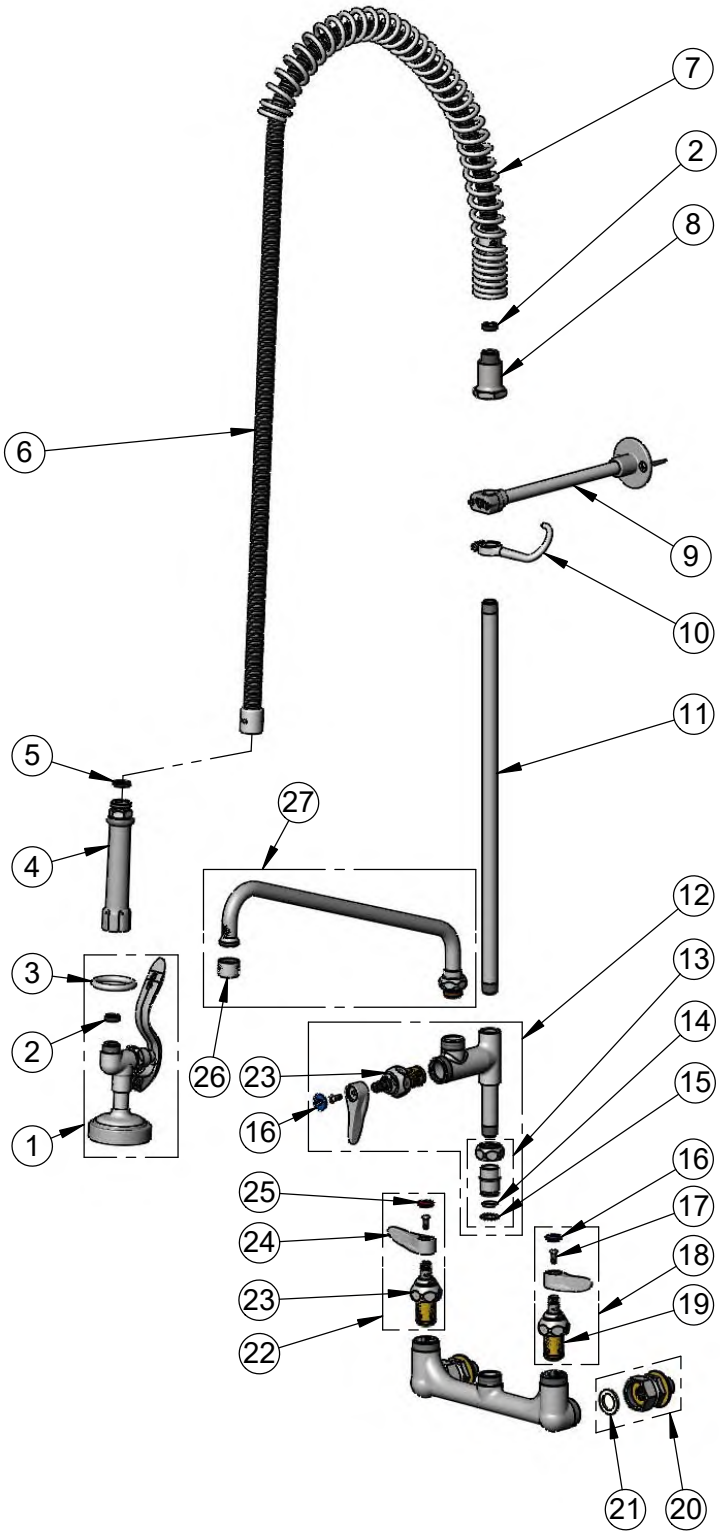
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Travelers Rest, SC 29690

Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

11.40.0N.311

Model No.
B-0133-01

Item No.



ITEM NO.	SALES NO.	DESCRIPTION
1	B-0107	1.15 GPM Spray Valve
2	010476-45	#27 Washer
3	000907-45	Spray Valve Hold Down Ring
4	002987-40	Grip Handle
5	001014-45	Washer, B-0100 Hose Barrel
6	B-0056-H2A	56" Flexible Stainless Steel Hose, Less Handle
7	000888-45	EasyInstall Overhead Spring
8	000821-40	Spring Body
9	B-0109-02	9" Wall Bracket
10	004R	Finger Hook
11	000369-40	3/8" NPT x 18" Riser
12	B-0155-LNEZ	EasyInstall Add-On Faucet w/ Quarter-Turn Eterna Cartridge, RTC & Lever Handle, Less Nozzle
13	EZ-K	EasyInstall Kit
14	001065-45	O-Ring
15	014200-45	Star Washer, Anti-Rotation
16	018506-19NS	Blue Button Index, Press-in
17	000925-45	Lab Handle Screw
18	002711-40NS	Quarter-Turn Eterna Cartridge w/ Spring Check, Handle, Blue Index & Screw, LTC
19	012442-40NS	Quarter-Turn Eterna Cartridge w/ Spring Check, LTC
20	00CC	1/2" NPT Male Inlet Flange
21	001019-45	Coupling Nut Washer
22	002712-40NS	Quarter-Turn Eterna Cartridge w/ Spring Check, Handle, Red Index & Screw, RTC
23	012443-40NS	Quarter-Turn Eterna Cartridge w/ Spring Check, RTC
24	001638-45NS	Lever Handle (New Style)
25	001193-19NS	Red Button Index, Press-in
26	B-PT	Full Flow Stream Regulator, 55/64-27
27	063X	14" Swing Nozzle

Product Specifications:

Pre-Rinse Unit: EasyInstall 8" Wall Mount Mixing Faucet, Quarter-Turn Eterna Cartridges w/ Spring Checks, Lever Handles, Add-On Faucet, 14" Swing Nozzle, 56" Flexible Stainless Steel Hose, 1.15 GPM Spray Valve, 9" Wall Bracket & 1/2" NPT Male Inlets

Product Compliance:

ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
2019 DOE PRSV - Class II

Drawn:	Checked:	Approved:	Date:	Scale:	Sheet:
LSA	KJG	JHB	03/03/20	NTS	2 of 2

Submittal Sheet

09/15/2026

ITEM# 2.39 - HAND SINK (1 EA REQ'D)

Advance Tabco 7-PS-80

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 stainless steel, heavy duty splash mounted faucet, lever drain with overflow, P-trap, soap & towel dispenser, wall bracket, NSF, cCSAus

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

HAND SINKS

with SOAP and PAPER TOWEL DISPENSER

Conforms To NSF 61/9 Lead Free Requirements

11 40 01-313

TOUCHLESS SOAP DISPENSER



7-PS-131



7-PS-79



7-PS-80

Includes Side supports



7-PS-69



7-PS-85

Includes Skirt

Item #: _____ **Qty #:** _____

Model #: _____

Project #: _____

FEATURES:
One piece **Deep Drawn** sink bowl design.
"Z" bracket wall mounting plate
Keyhole wall mount bracket.
C-fold style towel dispenser with hinged towel box.

Specific Unit Features:

7-PS-69:
10" x 14" x 5" sink bowl.
Splash mount liquid soap dispenser.
K-69 heavy duty splash mount faucet (with wrist handles)
Side support brackets.
Lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-79:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.

7-PS-80:
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser
Includes lever operated drain, built-in overflow with plastic overflow tube and spring clamps.
1 1/2" P-trap.

7-PS-85
10" x 14" x 5" sink bowl.
K-59 gooseneck faucet.
Splash mount liquid soap dispenser.
Chrome plated 1 1/2" p-trap & apron.

7-PS-131:
10" x 14" x 5" sink bowl.
K-175 electronic faucet.
Splash mount touchless liquid soap dispenser.
Stainless steel 1-1/2" IPS basket drain.
7-3/4" Side Splashes.

CONSTRUCTION:
All TIG welded.
All sink bowls have a large liberal radii with a minimum dimension of 2" and are rectangular in design.
Welded areas blended to match adjacent surfaces and to a satin finish.
Die formed countertop edge with a no-drip offset.

MATERIAL:
Heavy gauge type 304 series stainless steel.
Galvanized wall bracket.
All fittings are brass / chrome plated unless otherwise indicated.

MECHANICAL:
Faucet supply is 1/2" ips male thread hot and cold.

Faucet Flow Rate:
1.0 GPM/3.8 LPM aerator. 60 PSI.
7-PS-131 - 2.2 GPM/8.328 LPM aerator. 60 PSI.

FRONT LOAD TOWEL DISPENSER HAND SINKS

7-PS-41



A.D.A. Compliant

Electronic Faucet



7-PS-46

CLICK HERE TO VIEW SPEC SHEET

HANDS-FREE TOUCHLESS SOAP DISPENSER UPGRADE



7-PS-104

- Wall Mounted
- A/C or Battery Powered (Requires 4 "AA" Batteries. Not Included)
- Low Soap Indicator Window
- Includes Wall Bracket & Hardware
- Uses Liquid Soap

(Excludes 7-PS-131)

CLICK HERE TO VIEW SPEC SHEET

⚠ **WARNING:** Equipment that includes a faucet may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info., visit www.p65warnings.ca.gov.

ADVANCE TABCO
SMART FABRICATION™
www.advancetabco.com

Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

For Orders & Customer Service:
Email: customer@advancetabco.com or Fax: 631-242-6900

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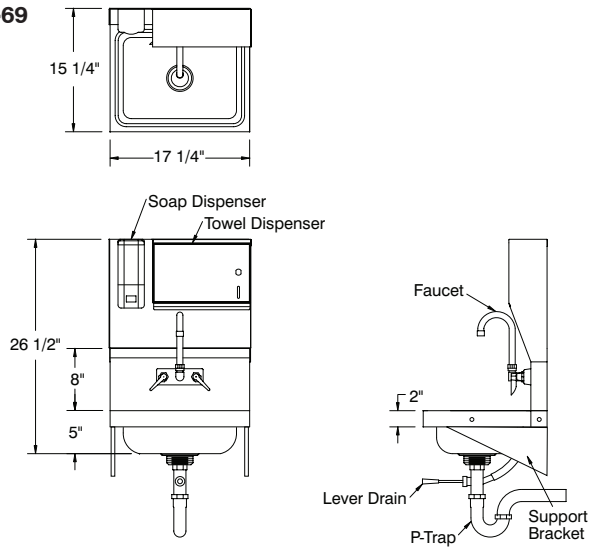
REF-B

DIMENSIONS and SPECIFICATIONS

11 40 01-314

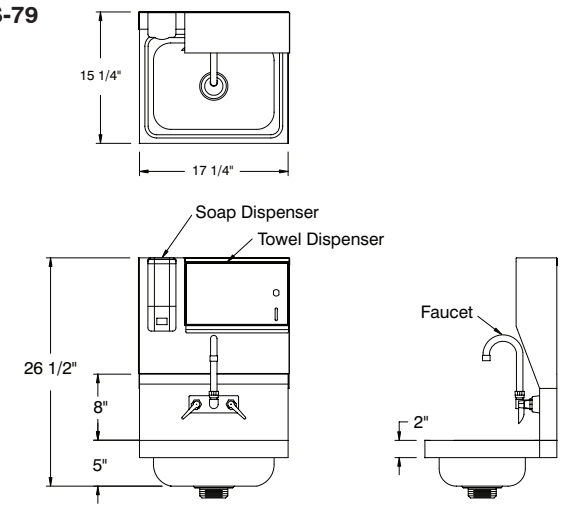
TOL Overall: ± .500" Interior: ± .250" **FITTINGS SUPPLIED AS SHOWN** **ALL DIMENSIONS ARE TYPICAL**

7-PS-69



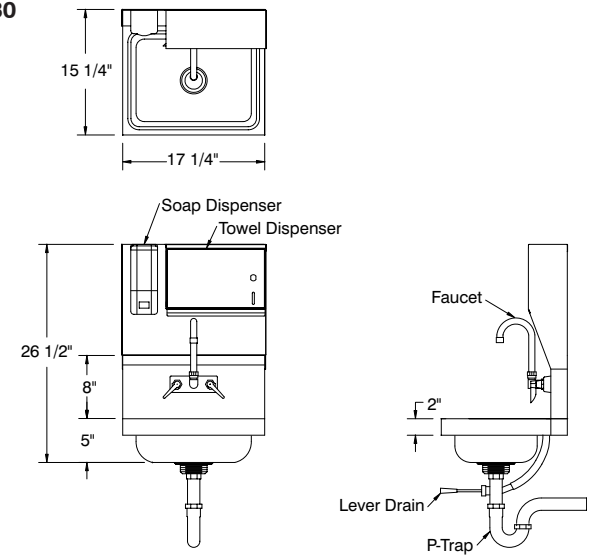
35 lbs.

7-PS-79



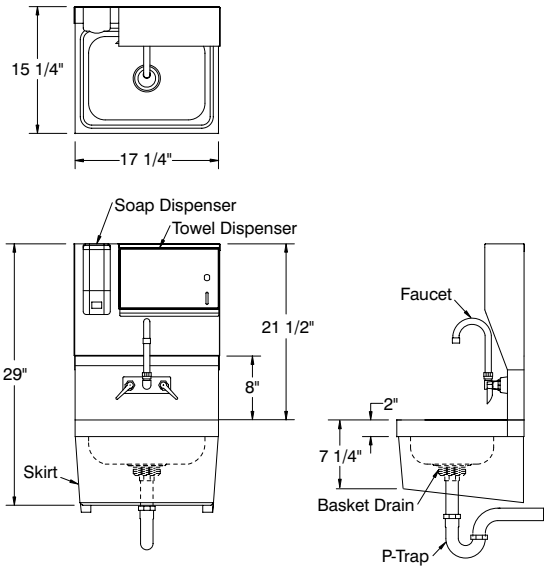
32 lbs.

7-PS-80



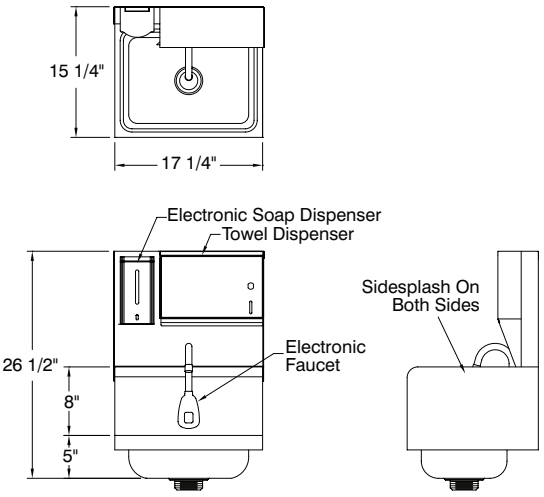
32 lbs.

7-PS-85



35 lbs.

7-PS-131



30 lbs.

ADVANCE TABCO
SMART FABRICATION

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, FEBRUARY 2024

23141 SUNY Faye Corey Student Union

11 40 01-315

Submittal Sheet

09/15/2026

ITEM# 2.40 - DISPOSER (1 EA REQ'D)

Salvajor 300-SA-3-ARSS

Disposer, Sink Assembly, 3-1/2" sink collar, 3 Hp motor, start/stop push button, drain/flush/time delay, automatic reversing & water saving ARSS control, includes fixed nozzle, chrome plated vacuum breaker, solenoid valve, sink stopper & flow control, heat treated aluminum alloy housing, single support leg, UL, CE

ACCESSORIES

Mfr	Qty	Model	Spec
Salvajor	1		
Salvajor	1	980105	Mounting bracket for ARSS-2, ARSS, ARSS-LD & WSP

11 40 01-316

SALVAJOR® Food Waste Disposer 3 HP - Model 300

JOB: _____ **Item No.:** _____



SPECIFICATIONS:

CORROSION RESISTANT BODY
Permanent molded from heat treated aluminum alloy.

EXTENDED LIP WATER SEAL
Protects the motor from damage by water.

TAPERED ROLLER BEARING
Provides longer motor life, quiet operation and shock absorbing.

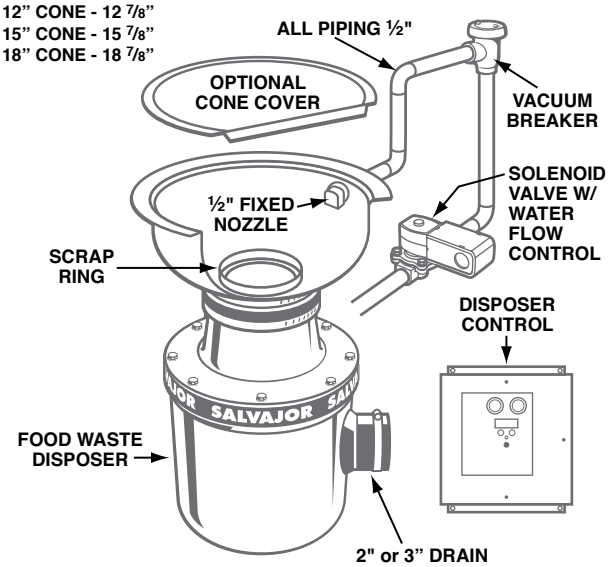
WATER COOLED MOTOR
Provides maximum efficiency and longer life.

QUIET OPERATION
Extra thick rubber mounting adaptor and drain outlet isolates sound and eliminates vibration.

WASTE MIXING CHAMBER
Extra large to ensure proper mixture of water to waste.

Cone Assembly

TABLE CUT-OUT:
12" CONE - 12 7/8"
15" CONE - 15 7/8"
18" CONE - 18 7/8"



NOTE: INSTALL PER ALL APPLICABLE CODES

NEMA 4 Watertight Controls



MSS



MRSS



ARSS-2



ARSS

Optional Line Disconnect (LD) available on MSS, MRSS, & ARSS

FULL LOAD AMPS

☐	208 Volts	3 Phase	8.8 Amps
☐	230 Volts	3 Phase	8.0 Amps
☐	460 Volts	3 Phase	4.0 Amps

◆ SPECIFY EXACT OPERATING VOLTAGE ◆

11 40 01-317

Model 300 Food Waste Disposer

3 HP - 3 Phase

SPECIFICATIONS:

MOUNTING – Rubber adaptor above grind chamber and rubber drain outlet isolates sound and eliminates vibration. No metal to metal contact.

EXTERIOR HOUSING – Permanent molded from heat treated, corrosion resistant aluminum alloy then computer machined to a smooth polished finish. Paint free.

SHREDDER – 9 inch diameter, machined high strength, wear resistant hardened carbide alloy.

ROTOR – 9 inch diameter with 4 cutter bars, machined high strength, wear resistant hardened carbide alloy.

MOTOR – 3 HP totally enclosed. Fan cooled and water cooled for efficiency and longer life.
Built-in manual reset thermal overload protection.
Available in 208-230/460 volts, 60 cycle, 3 phase.

BEARINGS – Tapered roller (top)
Sealed ball (bottom)

SEAL – Extended Lip Water Seal.

WATER REQUIREMENT – 8 gallons of cold water per minute.

WASTE OUTLET – Rubber drain accepts 2” piping or 3” piping by removing drain insert.

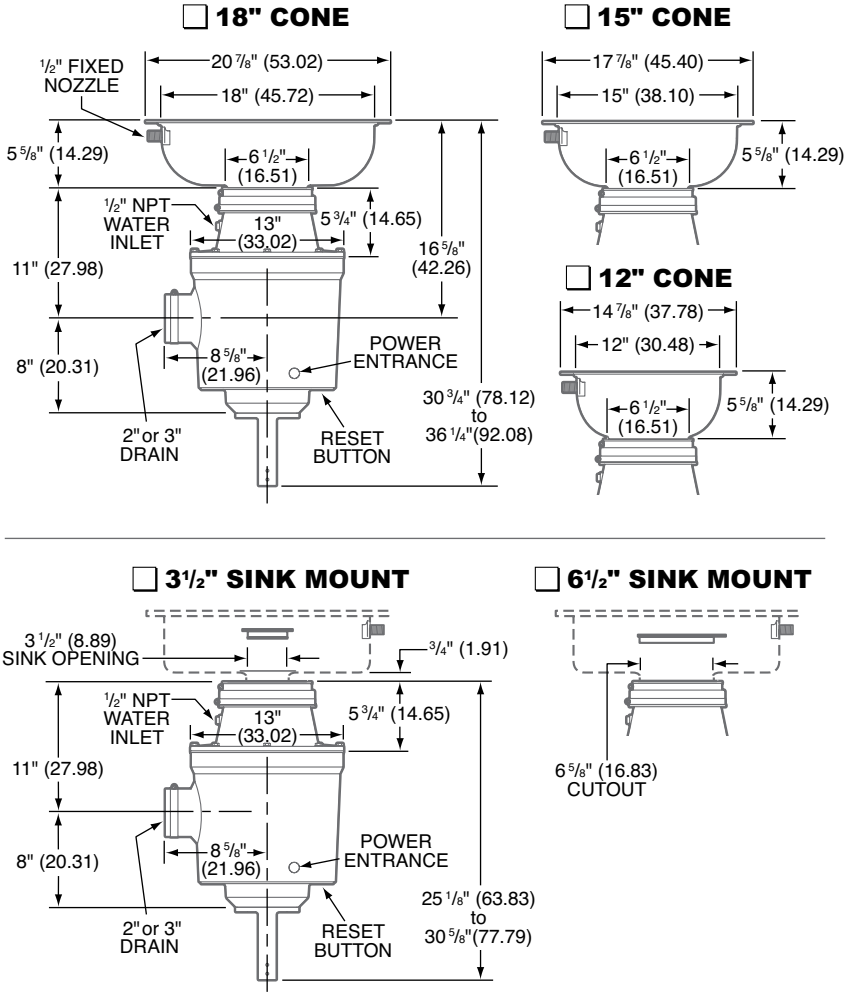
DUAL DIRECTION GRINDING – Designed to operate in either direction. Direction of rotation can be controlled when installed with automatic reversing controls. ***Reversing rotation can double cutting teeth life.***

LEG SUPPORT – Single leg, adjustable.

ASSEMBLIES: (See Specification Sheet)
CA – Cone Assembly with 12”, 15” or 18” Cone
SA – Sink Assembly with 3½” or 6½” Sink Collar

DISPOSER CONTROLS: (See Specification Sheet)
MSS: (Non Reversing)
MRSS: (Manual Reversing)
ARSS-2: (Automatic Reversing)
ARSS: (Automatic Reversing with Water Saver)

DIMENSIONS



NOTE: Dimensions in parenthesis are in centimeters
(Specifications subject to change without notice)
Current specification details may be found online at www.salvajor.com

SAMPLE SPECIFICATION

300	-	CA	-	18	ARSS	(230/60/3)
Model		Cone Size		Assembly	Disposer Control	Electrical Specs.

◆ SPECIFY EXACT OPERATING VOLTAGE ◆

SALVAJOR®
Manufacturers of Commercial Food Waste Solutions - *Since 1944*

4530 East 75th Terrace Kansas City, MO 64132-2081, USA
816.363.1030 | Toll Free: 1.800.725.8256 | Service: 1.888.725.8256 | Fax: 1.800.832.9373
sales@salvajor.com | service@salvajor.com | **www.salvajor.com**

Printed in USA
Form No.S300 (05-18)

11 40 01-318

SALVAJOR® Pre-Wired Control Panels

For Food Waste Disposer Models 100 - 200 - 300 - 500

MSS



NON-REVERSING

1-PHASE
115V, 208V, 230V

3-PHASE
208V, 230V, 460V

For use in small to medium kitchens, vegetable prep areas, pot sink and soiled dish tables.

SPECIFICATIONS:
- NEMA 4 Stainless Steel Corrosion-Resistant Enclosure
- Magnetic Contactor
- START/STOP Push Buttons
- Terminal Strip Connections

ACCESSORIES:
- Safety Line Disconnect (LD)
- **P** - Mounted Solenoid Valve and Flow Control
- **PP** - Mounted Solenoid Valve, Flow Control and Pressure Switch
- **#980104** - Mounting Bracket

MRSS



MANUAL REVERSING

1-PHASE
115V, 208V, 230V

3-PHASE
208V, 230V, 460V

For use in small to medium kitchens, vegetable prep areas, pot sink and soiled dish tables.

SPECIFICATIONS:
- NEMA 4 Stainless Steel Corrosion-Resistant Enclosure
- Manual Reversing Magnetic Contactors
- START/STOP Push Buttons
- Forward/Reverse Switch

ACCESSORIES:
- Safety Line Disconnect (LD)
- **P** - Mounted Solenoid Valve and Flow Control
- **PP** - Mounted Solenoid Valve, Flow Control and Pressure Switch
- **#980104** Mounting Bracket

ARSS-2



AUTOMATIC REVERSING

1-PHASE
115V, 208V, 230V

3-PHASE
208V, 230V, 460V

For use in medium to large kitchens, all prep areas and soiled dish tables.

SPECIFICATIONS:
- NEMA 4 Stainless Steel Watertight Enclosure
- 24 Volt Safety Circuitry
- Automatic Reversing Magnetic Contactors
- Terminal Strip Connections
- START/STOP Push Buttons

ACCESSORIES:
- **P** - Mounted Solenoid Valve and Flow Control
- **PP** - Mounted Solenoid Valve, Flow Control and Pressure Switch
- **#980105** Mounting Bracket

ARSS



AUTOMATIC REVERSING

1-PHASE
115V, 208V, 230V

3-PHASE
208V, 230V, 460V

For use in medium to large kitchens, all prep areas and soiled dish tables.

SPECIFICATIONS:
- NEMA 4 Stainless Steel Watertight Enclosure
- Solid State Control Circuit
- 24 Volt Safety Circuitry
- 20 Second Drain Flush
- Automatic Reversing Magnetic Contactors
- Terminal Strip Connections
- START/STOP Push Buttons
- Energy/Water-Saving Mode
- 3 Second Reversing Safety Delay
- User Adjustable Run Time
- LCD Status Readout
- Operator Sensor Capable

ACCESSORIES:
- Safety Line Disconnect (LD)
- **P** - Mounted Solenoid Valve and Flow Control
- **PP** - Mounted Solenoid Valve, Flow Control and Pressure Switch
- **#980105** Mounting Bracket
- **#980609** Operator Sensor Includes Low Flow Solenoid Valve

Product configurations protected by U.S. Pat. No. 7,815,134 when used with sensor

SAFETY FEATURE:

All Salvajor Controls include an operator safety feature that prevents automatic starting of the disposer after a power interruption.

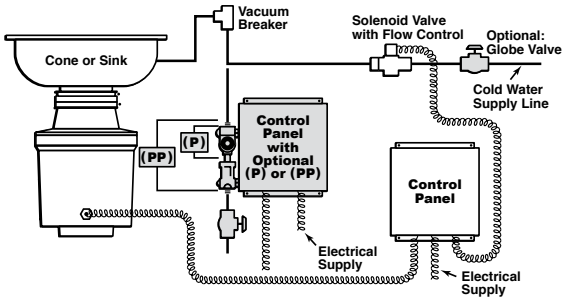
ALL SALVAJOR CONTROLS ARE:

11 40 01-319

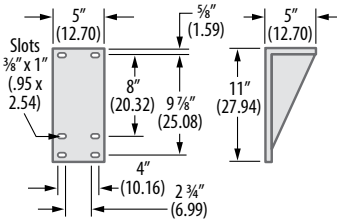
Disposer Controls

DETAILS AND DIMENSIONS

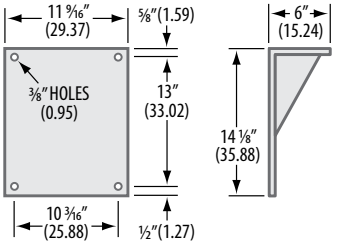
Typical Installation of a Salvajor Disposer with: MSS, MRSS, ARSS-2 or ARSS Control



980104 Optional Mounting Bracket



980105 Optional Mounting Bracket

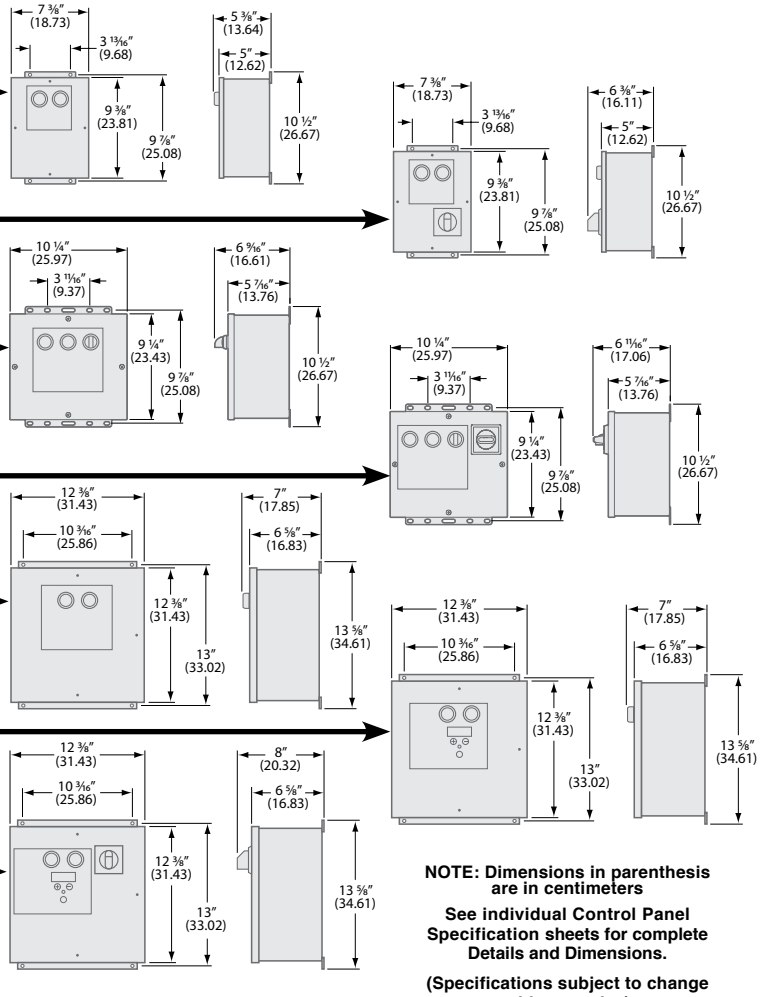


ITEM NUMBERS FOR ORDERING

CONTROL MODEL	VOLTS	PHASE	ITEM NO.
MSS	115	1	MSS4
	208-230	1	MSS5
	208-230	3	MSS7
	460	3	MSS9
MSS-LD	115	1	MSSLD4
	208-230	1	MSSLD5
	208-230	3	MSSLD7
	460	3	MSSLD9
MRSS	115	1	MRSS4
	208-230	1	MRSS5
	208-230	3	MRSS7
	460	3	MRSS9
MRSS-LD	115	1	MRSSLD4
	208-230	1	MRSSLD5
	208-230	3	MRSSLD7
	460	3	MRSSLD9
ARSS-2	115	1	ARSS24
	208-230	1	ARSS25
	208-230	3	ARSS27
	460	3	ARSS29
ARSS	115	1	ARSS4
	208-230	1	ARSS5
	208-230	3	ARSS7
	460	3	ARSS9
ARSS-LD	115	1	ARSSLD4
	208-230	1	ARSSLD5
	208-230	3	ARSSLD7
	460	3	ARSSLD9

◆ SPECIFY EXACT OPERATING VOLTAGE ◆

DIMENSIONS



NOTE: Dimensions in parenthesis are in centimeters

See individual Control Panel Specification sheets for complete Details and Dimensions.

(Specifications subject to change without notice)

Current specification details may be found online at www.salvajor.com

SALVAJOR®

Manufacturers of Commercial Food Waste Solutions - *Since 1944*

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Printed in USA
Form No. CCP (05-18)

11 40 01-320

Submittal Sheet

09/15/2026

ITEM# 2.41 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-321

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-322

Submittal Sheet

09/15/2026

ITEM# 2.42 - CAN RACK (1 EA REQ'D)

Cambro EXA243672C96480

Camshelving® Elements XTRA Ultimate #10 Can Rack Stationary Add-On Unit, 24"W x 36"L x 72"H (26"W with can rack overhang), includes: (1) assembled post kits (posts constructed of steel with polypropylene exterior), (9) traverses & molded-in dovetails, (15) can rack panels, (72) can rack brackets, 800 lbs. capacity per shelf /2,400 lbs. max capacity, speckled gray (assembly required) (NOTE: This is a new product line. It is NOT compatible with original Elements Series products.)

ACCESSORIES

Mfr	Qty	Model	Spec
Cambro	1	ESR2436151	Camshelving® Elements Full Shelf Rail Kit, 24"W x 36"L x 4-1/4"H, includes (2) double level side rails, (2) double level end rails, side & end brackets, polypropylene, soft gray

CAMBRO

Project _____

11 40 01-323

Item No. _____

Model No. _____

Quantity _____

Camshelving® Ultimate #10 Can Rack

Premium Series Full-Size Rack
Elements XTRA Series Full-Size Rack

HEIGHT	DEPTH	LENGTH
1	1	1
72"	24"	36"

* Standard shelving depth. Actual assembled unit depth is 25.9" (65,8 cm).

- **Units include:** 1 or 2 factory assembled stationary post kits, 9 each traverses,15 each can rack panels and 72 each can rack brackets (12 bags of 6 each). Ships knockdown, complete in 1 carton.

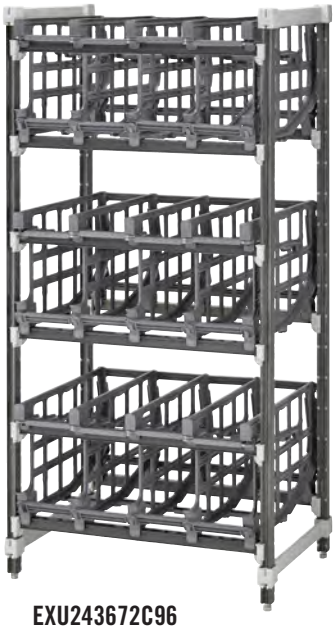
Store Safe

Features & Benefits

- Easy to assemble, stationary can storage units with patented front loading, gravity fed rack component system that supports proper FIFO inventory management.
- Ideal for schools, colleges/universities, hospitals and any foodservice operation with high volume can usage/storage requirements. Install free standing units or share posts with other units to maximize space when combined with other units along a wall.
- Unique, can storage racks install directly onto 3 traverses – 2 front and 1 back. Side panels and brackets snap together. Connect and create 4 rows of can storage per level / tier.
- Store 8 each #10 cans or 12 each #5 cans per individual racks.
- Store 32 each #10 cans or 48 each #5 cans per level / tier.
- Can rack panels and brackets are made of highly durable plastic material that will never dent or bend with use. Once assembled and placed onto traverses, racks remain securely in place even with constant loading and removal of cans.
- Premium Series posts and traverses have a steel core and smooth polypropylene exterior for superior strength and durability. Traverse dovetails are molded into posts.
- Elements XTRA Series posts and traverses are made of extremely strong composite and plastic materials. Traverse dovetails must be installed onto the posts.
- Uniquely engineered Post Connectors offer exceptional cross stabilization. Weight bearing is uncompromised.
- Post and traverses easily wipe clean. Traverses, can rack panels and brackets can be removed and cleaned in the dishwasher.
- Requires minimal assembly. Use a rubber mallet only to install traverses.
- Lifetime warranty against rust and corrosion (posts, traverses, can rack panels and brackets).



CPU243672C96
Premium Unit (with Cans)



EXU243672C96
Elements XTRA Unit (Empty)

Holding Capacity per Unit

96 each #10 cans
144 each #5 cans

- Maximum weight bearing capacity per unit: 2000 lbs. (910 kg), evenly distributed.
- Available in 1 color: Speckled Gray (480).
- Ships knockdown.
- #10 Single and Add-on Can Racks are covered by U.S. Patent D828,145 S and D827,421 S.

Approvals

NSF COMPONENT

Post Connectors, Corner Connectors, Floor Fastener, Wall Fastener, Identification Tags, Shelf Rails, Single Shelf Security Cage, Peg Board and Shelf Divider Bars are not NSF listed.

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Printed in U.S.A. 09/23

Camshelving® Ultimate #10 Can Rack

Premium Series Full-Size Rack

Elements XTRA Series Full-Size Rack

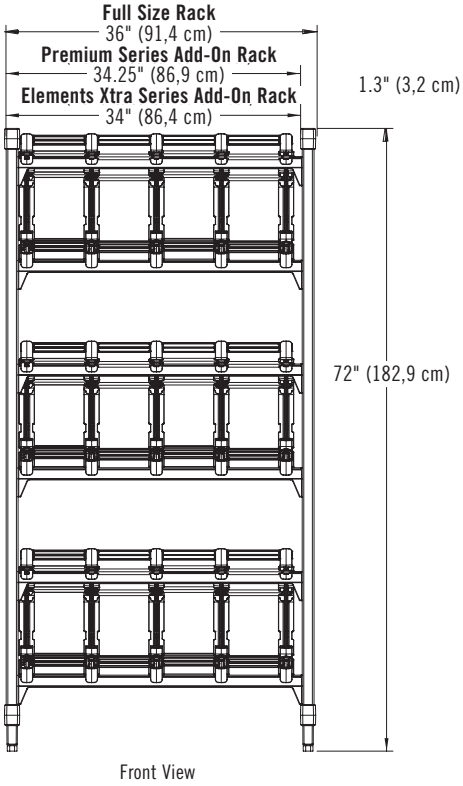
Project _____

Item No. _____ 11 40 01-324

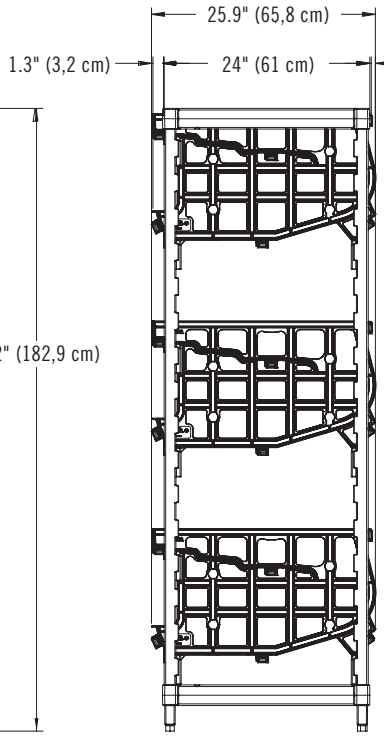
Model No. _____

Quantity _____

Full Size Rack

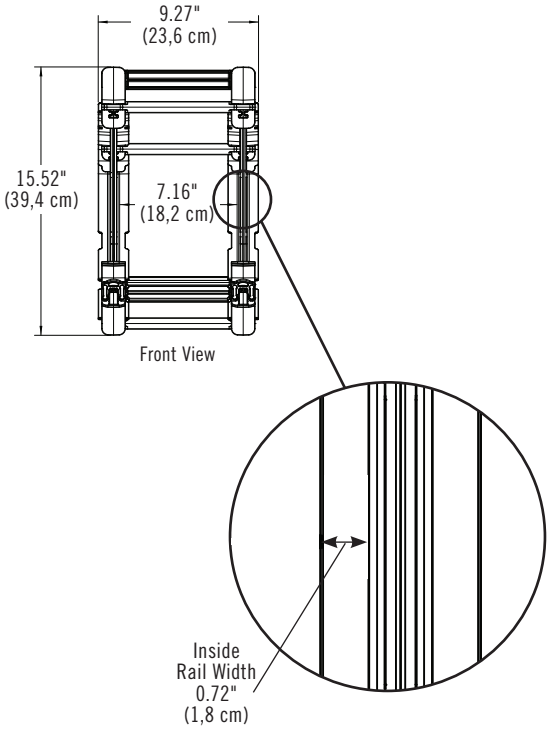


Front View



Side View

Can Rack Single Unit



Front View

Specifications

Code	Description	Dimensions D x L x H	Unit Weight lbs. / kg
Premium Series			
CPU243672C96	Full-Size Starter Unit Rack	25.9" x 36" x 72" (65,8 x 91,4 x 182,9 cm)	107.1 (48,7)
CPA243672C96	Full-Size Add-on Unit Rack	25.9" x 34.25" x 72" (65,8 x 86,9 x 182,9 cm)	91.4 (41,6)
Elements XTRA Series			
EXU243672C96	Full-Size Starter Unit Rack	25.9" x 36" x 72" (65,8 x 91,4 x 182,9 cm)	85.3 (38,7)
EXA243672C96	Full-Size Add-on Unit Rack	25.9" x 34" x 72" (65,8 x 86,4 x 182,9 cm)	74.3 (33,7)

Color: Speckled Gray (480).

Architect Specs

Post and Traverses:
Premium Series: Internal steel core, reinforced polypropylene exterior
Elements XTRA Series: Proprietary non-corrosive composite material
Post Connectors: Reinforced polypropylene
Can Rack Panel and Bracket: Reinforced nylon
Post Connector Collar Wedges: Reinforced nylon (Elements XTRA Series Only)
Traverse Dovetails: Reinforced nylon (Elements XTRA Series Only)

Optional Accessories

- ❑ **Wall Fastener**
- ❑ **Floor Fastener**
- ❑ **Dunnage Stand**

Approvals

NSF COMPONENT

Post Connectors, Corner Connectors, Floor Fastener, Wall Fastener, Identification Tags, Shelf Rails, Single Shelf Security Cage, Peg Board and Shelf Divider Bars are not NSF listed.

CAMBRO

www.cambro.com

Information and specifications are subject to change without notice. Please confirm at time of order.

Telephone: (714) 848-1555 **Toll Free:** (800) 854-7631 **Customer Service:** (800) 833-3003

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EXCS10

D0082307

CAMSHELVING® SHELF RAILS

11 40 01 325

Extra Protection for Shelf Contents





SHELVING for LIFE™

- Brackets are quick and easy to install and remove.
- Fits shelving units 24" to 72" (61 to 182,9 cm) wide and 14" to 24" (35,5 to 61 cm) deep, for all Camshelving® Series*.
- Double rods provide maximum security for shelf contents.
- Shelf rails can be used with Divider Panels and Drying Racks.
- Available in single, 3, or 4-sided kits to meet all foodservice needs.

CAMBRO®
TRUSTED FOR GENERATIONS™

*14" depth, 24" and 72" lengths not available for Basics Plus Series.

www.cambro.com

11 40 01-326

Camshelving® Shelf Rails

Camshelving Shelf Rails are now available for all 3 shelving lines. Ideal for stationary, mobile or high density units to keep items from falling off shelves.

Full Shelf Rail Kits*

14" DEPTH

PREMIUM SERIES	ELEMENTS SERIES	BASICS PLUS SERIES	LENGTH
CPR1424	ESR1424	—	24"
CPR1430	ESR1430	—	30"
CPR1436	ESR1436	—	36"
CPR1442	ESR1442	—	42"
CPR1448	ESR1448	—	48"
CPR1454	ESR1454	—	54"
CPR1460	ESR1460	—	60"
CPR1472	ESR1472	—	72"

18" DEPTH

CPR1824	ESR1824	—	24"
CPR1830	ESR1830	CBR1830	30"
CPR1836	ESR1836	CBR1836	36"
CPR1842	ESR1842	CBR1842	42"
CPR1848	ESR1848	CBR1848	48"
CPR1854	ESR1854	CBR1854	54"
CPR1860	ESR1860	CBR1860	60"
CPR1872	ESR1872	—	72"

21" DEPTH

CPR2124	ESR2124	—	24"
CPR2130	ESR2130	CBR2130	30"
CPR2136	ESR2136	CBR2136	36"
CPR2142	ESR2142	CBR2142	42"
CPR2148	ESR2148	CBR2148	48"
CPR2154	ESR2154	CBR2154	54"
CPR2160	ESR2160	CBR2160	60"
CPR2172	ESR2172	—	72"

24" DEPTH

CPR2424	ESR2424	—	24"
CPR2430	ESR2430	CBR2430	30"
CPR2436	ESR2436	CBR2436	36"
CPR2442	ESR2442	CBR2442	42"
CPR2448	ESR2448	CBR2448	48"
CPR2454	ESR2454	CBR2454	54"
CPR2460	ESR2460	CBR2460	60"
CPR2472	ESR2472	—	72"

*Full rail kits include 2 sides and 2 ends in 1 box.

Three-Quarter Shelf Rail Kits**

14" DEPTH

PREMIUM SERIES	ELEMENTS SERIES	BASICS PLUS SERIES	LENGTH	LST PRICE EA.
CPR14243	ESR14243	—	24"	
CPR14303	ESR14303	—	30"	
CPR14363	ESR14363	—	36"	
CPR14423	ESR14423	—	42"	
CPR14483	ESR14483	—	48"	
CPR14543	ESR14543	—	54"	
CPR14603	ESR14603	—	60"	
CPR14723	ESR14723	—	72"	

18" DEPTH

CPR18243	ESR18243	—	24"
CPR18303	ESR18303	CBR18303	30"
CPR18363	ESR18363	CBR18363	36"
CPR18423	ESR18423	CBR18423	42"
CPR18483	ESR18483	CBR18483	48"
CPR18543	ESR18543	CBR18543	54"
CPR18603	ESR18603	CBR18603	60"
CPR18723	ESR18723	—	72"

21" DEPTH

CPR21243	ESR21243	—	24"
CPR21303	ESR21303	CBR21303	30"
CPR21363	ESR21363	CBR21363	36"
CPR21423	ESR21423	CBR21423	42"
CPR21483	ESR21483	CBR21483	48"
CPR21543	ESR21543	CBR21543	54"
CPR21603	ESR21603	CBR21603	60"
CPR21723	ESR21723	—	72"

24" DEPTH

CPR24243	ESR24243	—	24"
CPR24303	ESR24303	CBR24303	30"
CPR24363	ESR24363	CBR24363	36"
CPR24423	ESR24423	CBR24423	42"
CPR24483	ESR24483	CBR24483	48"
CPR24543	ESR24543	CBR24543	54"
CPR24603	ESR24603	CBR24603	60"
CPR24723	ESR24723	—	72"

**Three-quarter rail kits include 1 side and 2 ends in 1 box.

Single Rail Kits

SIDE RAIL

PREMIUM SERIES	ELEMENTS SERIES	BASICS PLUS SERIES	LENGTH
CPR24S	ESR24S	—	24"
CPR30S	ESR30S	CBR30S	30"
CPR36S	ESR36S	CBR36S	36"
CPR42S	ESR42S	CBR42S	42"
CPR48S	ESR48S	CBR48S	48"
CPR54S	ESR54S	CBR54S	54"
CPR60S	ESR60S	CBR60S	60"
CPR72S	ESR72S	—	72"

END RAIL

PREMIUM SERIES	ELEMENTS SERIES	BASICS PLUS SERIES	DEPTH
CPR14E	ESR14E	—	14"
CPR18E	ESR18E	CBR18E	18"
CPR21E	ESR21E	CBR21E	21"
CPR24E	ESR24E	CBR24E	24"





Elements Series Undercounter Unit shown with Three-Quarter Shelf Rail Kit.

Case Pack: 1 kit **Color:** Soft Gray (151).

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D101905

CAMSHELVING® ACCESSORIES

11 40 01-327

Shelf Divider Bars (for 24" deep shelf only)

Create a custom service or storage station for food pans, boxes or dish racks. Install straight or angled dividers directly onto shelf traverses.

CODE	DESCRIPTION
Premium Series	
CSDBA	Angled Divider Bar
CSDBS	Straight Divider Bar
Elements Series	
EDBA	Angled Divider Bar
EDBS	Straight Divider Bar

Case Pack: 4 **Color:** Speckled Gray (480).





Shelf Rails

Use to prevent contents from falling off shelves. Protect individual sides or ends or wrap a full shelf. Rods are made from a strong composite material that is highly durable and will never rust or corrode.

Fits shelving units 24" to 72" wide and 14" to 24" deep.

Full or three-quarter shelf kits help to streamline installations and significantly reduces carton waste.

Full Shelf Rail Kits

PREMIUM CODE	ELEMENTS CODE	New! BASICS PLUS CODE	DIMENSION D x L
Full Shelf Rail Kits (2 sides, 2 ends)			
CPR2436	ESR2436	CBR2436	24" x 36"
CPR2442	ESR2442	CBR2442	24" x 42"
CPR2448	ESR2448	CBR2448	24" x 48"
3/4 Shelf Rail Kits (1 side, 2 ends)			
CPR24363	ESR24363	CBR24363	24" x 36"
CPR24423	ESR24423	CBR24423	24" x 42"
CPR24483	ESR24483	CBR24483	24" x 48"

Case Pack: 1 **Color:** Soft Gray (151).



Shelf Rail kits are available in all depths and all lengths. To see the entire selection of Full & 3/4 kits, see the Camshelving Product Specification and Price List.

Single Side Rail Kits

PREMIUM CODE	ELEMENTS CODE	New! BASICS PLUS CODE	DIMENSION LENGTH
CPR24S	ESR24S	—	24"
CPR30S	ESR30S	CBR30S	30"
CPR36S	ESR36S	CBR36S	36"
CPR42S	ESR42S	CBR42S	42"
CPR48S	ESR48S	CBR48S	48"
CPR54S	ESR54S	CBR54S	54"
CPR60S	ESR60S	CBR60S	60"
CPR72S	ESR72S	—	72"

Case Pack: 1 **Color:** Soft Gray (151).

Single End Rail Kits

PREMIUM CODE	ELEMENTS CODE	New! BASICS PLUS CODE	DIMENSION DEPTH
CPR14E	ESR14E	—	14"
CPR18E	ESR18E	CBR18E	18"
CPR21E	ESR21E	CBR21E	21"
CPR24E	ESR24E	CBR24E	24"

Case Pack: 1 **Color:** Soft Gray (151).



23141 SUNY Faye Corey Student Union

11 40 01-328

Submittal Sheet

09/15/2026

ITEM# 2.43 - BUN PAN RACK (4 EA REQ'D)

Channel 400A

Bun Pan Rack, All-Welded, Standard Heavy-Duty Series, 20.5"W x 26"D x 70.25"H, Aluminum Construction, End Load, 2" Angle Spacing, (30) 18" x 26" or (60) 13" x 18" pans (2 per shelf), 5" Swivel Plate Casters model # CPS45U, Made in USA, NSF, 45lbs. (ITEM WEIGHT ONLY), weight does not include 50 lbs. for pallet weight

CHANNEL MANUFACTURING, INC.

Item No. 11 40 01-329

Quantity

Job Name

Spec No.

BUN PAN RACKS

FULL SIZE ALL WELDED

ALUMINUM OR STAINLESS CONSTRUCTION

Custom Sizes Available



401A Front Load



411A Side Load



401S Front Load

ALUMINUM		STAINLESS					
Model	Wt.	Model	Wt.	Spacing/Capacity	H	W	D
399A	53			FL 1-1/2"/ 40 Pans	70¼"	20½"	26"
400A	45	400S	75	FL 2"/ 30 Pans	70¼"	20½"	26"
401A	36	401S	57	FL 3"/ 20 Pans	70¼"	20½"	26"
402A	32	402S	47	FL 4"/ 15 Pans	70¼"	20½"	26"
403A	30	403S	41	FL 5"/ 12 Pans	70¼"	20½"	26"
404A	28	404S	35	FL 6"/ 10 Pans	70¼"	20½"	26"
405A	43	405S	70	FL 2"/ 27 Pans	64"	20½"	26"
406A	35	406S	53	FL 3"/ 18 Pans	64"	20½"	26"
410A	43	410S	70	SL 2"/ 30 Pans	70¼"	28½"	18"
411A	33	411S	55	SL 3"/ 20 Pans	70¼"	28½"	18"
412A	30	412S	44	SL 4"/ 15 Pans	70¼"	28½"	18"
413A	28	413S	38	SL 5"/ 12 Pans	70¼"	28½"	18"
414A	26	414S	33	SL 6"/ 10 Pans	70¼"	28½"	18"
415A	40	415S	65	SL 2"/ 27 Pans	64"	28½"	18"
416A	35	416S	50	SL 3"/ 18 Pans	64"	28½"	18"

Options:

- ❑ /011 Caster Brakes
- ❑ /052 5" X 2" Caster Upgrade
- ❑ /5B HD Caster Brakes
- ❑ /CC Card Clip Aluminum
- ❑ /022 Corner Bumpers (2)
- ❑ /024 Corner Bumpers (4)
- ❑ /PB Perimeter Bumper
- ❑ /VB VerticalBumper
- ❑ /009 Pan Stop Aluminum
- ❑ /010 Pan Stop Stainless
- ❑ /PG Pan Stop Gravity
- ❑ /015 Pan Stop Web-Strap
- ❑ /BA Solid Bottom Aluminum
- ❑ /A Solid Top Aluminum

APPLICATIONS: Mobile multi-purpose racks for holding, storing and transporting both plastic and aluminum. 18" X 26" Bun Pans, 18" X 13" Pans, and 17" X 25" Fryer Screens.

CONSTRUCTION: **Aluminum**: Heavy duty, high tensile extruded aluminum. Type 6063-T5 alloy. Lifetime guarantee against rust and corrosion. **Stainless**: 18 Gauge, 304 Series stainless steel.

TRAY SLIDES: Slides are 1" X 1-1/2" extruded aluminum angle heli-arc welded to frame. Bottom load ledge design.

FRAME AND CROSS SUPPORTS: Vertical and horizontal frame sections are 1" extruded aluminum tubing and 1" solid flat bar extruded aluminum or stainless.

CASTERS: Standard 5" full swivel non-marking casters. Casters are securely bolted to frame to facilitate replacements.

MADE IN THE USA NSF

Notes

55 Channel Drive • Port Washington, NY11050-2216
8891 NW 102nd Street • Medley, FL 33178
Tel: 516-944-6271 • Fax: 516-944-0625
Toll Free: 866-712-7283
www.channelmfg.com • Email: sales@channelmfg.com

11 40 01-330

Submittal Sheet

09/15/2026

ITEM# 2.44 - SHELVING, UNIT (6 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	8	MQ2142G	Quick Ship - MetroMax® Q Shelf, 42"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	8	MQ2148G	Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	8	MQ2154G	Quick Ship - MetroMax® Q Shelf, 54"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 600 lb. capacity per shelf, NSF
Metro	24	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	12	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	12	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

11 40 01-331

Item # _____

Job _____

We put space to work.

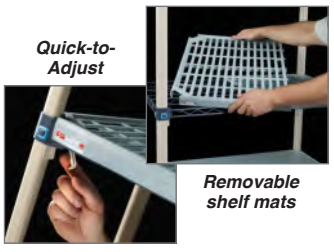
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

L02-178
Printed in U.S.A. 9/21

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Job _____

11 40 01 332

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



an Ali Group Company

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Job _____

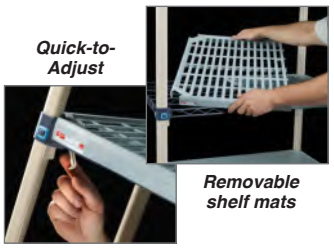
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Job _____

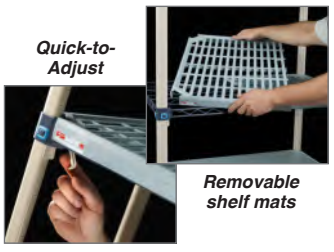
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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11 40 01-337

Item # _____

Job _____

We put space to work.

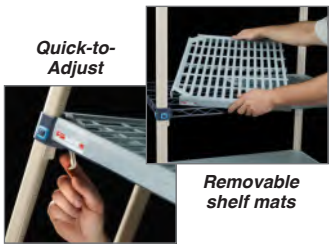
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

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Supports good HACCP processes

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Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.

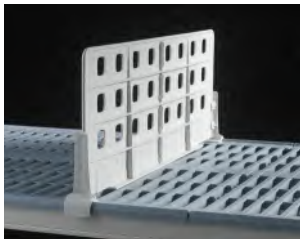
i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829



8" (203mm) Shelf Dividers — standard duty

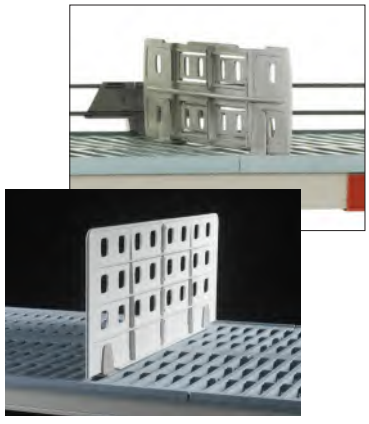
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.

i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610



Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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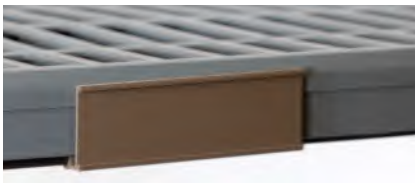
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.



i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152



MetroMax i with direct mount supports



x4

M9997-4



x4

MAX4-9997-4

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



Post Clamp

Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate

Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp

Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

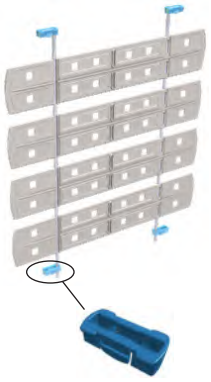
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



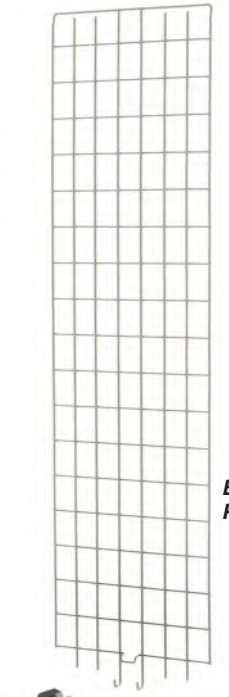
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



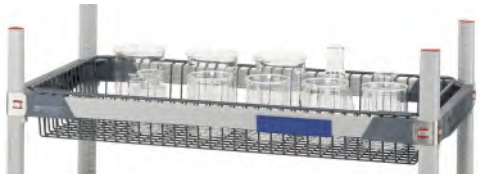
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

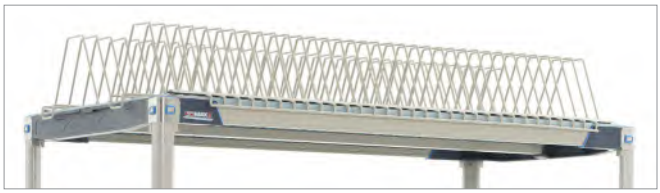
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

23141 SUNY Faye Corey Student Union

11 40 01 345

MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

11.40.01.346

MetroMax® Accessories

We put space to work.

"S" Hooks

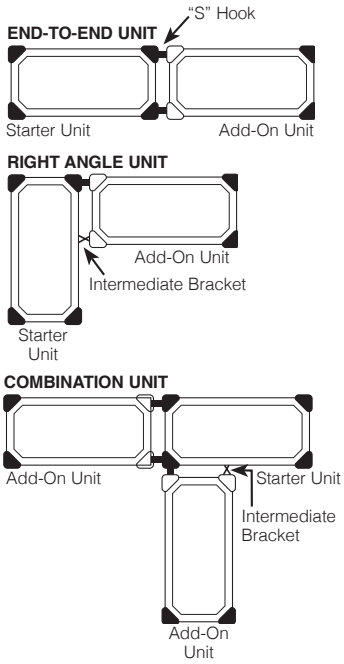
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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11 40 01-347

Submittal Sheet

09/15/2026

ITEM# 2.45 - WALL SHELF (2 EA REQ'D)

Advance Tabco WS-15-96

Shelf, wall-mounted, 96"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

WALL SHELVES

11 40 01-348

NSF



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



FEATURES:

Brackets can be positioned to accommodate wall studs.

Furnished with a 1-5/8" Bullnose edge with a 1-1/2" turn-up edge at rear. Ends are turned down square.

MATERIAL:

16 Gauge Series - 304 stainless steel polished to a satin finish.

18 Gauge Series - 430 stainless steel polished to a satin finish.

CONSTRUCTION:

Secured to wall by means of bolts through support brackets.

Units 7 ft. and larger are furnished with 3 brackets.

	10" Wide			12" Wide			15" Wide			18" Wide			
L	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	16 Ga.	18 Ga.	Approx. Wt.	Approx. Cu. Ft.
24"	WS-10-24-16	WS-10-24	8 lbs.	WS-12-24-16	WS-12-24	9 lbs.	WS-15-24-16	WS-15-24	11 lbs.	WS-18-24-16	WS-18-24	14 lbs.	3
30"	-	-	-	WS-12-30-16	WS-12-30	12 lbs.	-	-	-	-	-	-	4
36"	WS-10-36-16	WS-10-36	10 lbs.	WS-12-36-16	WS-12-36	12 lbs.	WS-15-36-16	WS-15-36	15 lbs.	WS-18-36-16	WS-18-36	21 lbs.	4
42"	-	-	-	WS-12-42-16	WS-12-42	14 lbs.	-	-	-	-	-	-	5
48"	WS-10-48-16	WS-10-48	12 lbs.	WS-12-48-16	WS-12-48	14 lbs.	WS-15-48-16	WS-15-48	18 lbs.	WS-18-48-16	WS-18-48	24 lbs.	5
60"	WS-10-60-16	WS-10-60	15 lbs.	WS-12-60-16	WS-12-60	17 lbs.	WS-15-60-16	WS-15-60	23 lbs.	WS-18-60-16	WS-18-60	28 lbs.	6
72"	WS-10-72-16	WS-10-72	17 lbs.	WS-12-72-16	WS-12-72	21 lbs.	WS-15-72-16	WS-15-72	28 lbs.	WS-18-72-16	WS-18-72	32 lbs.	7
84"	WS-10-84-16	WS-10-84	20 lbs.	WS-12-84-16	WS-12-84	25 lbs.	WS-15-84-16	WS-15-84	32 lbs.	WS-18-84-16	WS-18-84	36 lbs.	8
96"	WS-10-96-16	WS-10-96	23 lbs.	WS-12-96-16	WS-12-96	28 lbs.	WS-15-96-16	WS-15-96	36 lbs.	WS-18-96-16	WS-18-96	42 lbs.	10
108"	WS-10-108-16	WS-10-108	28 lbs.	WS-12-108-16	WS-12-108	32 lbs.	WS-15-108-16	WS-15-108	40 lbs.	WS-18-108-16	WS-18-108	48 lbs.	11
120"	WS-10-120-16	WS-10-120	32 lbs.	WS-12-120-16	WS-12-120	36 lbs.	WS-15-120-16	WS-15-120	44 lbs.	WS-18-120-16	WS-18-120	54 lbs.	12
132"	WS-10-132-16	WS-10-132	36 lbs.	WS-12-132-16	WS-12-132	42 lbs.	WS-15-132-16	WS-15-132	49 lbs.	WS-18-132-16	WS-18-132	60 lbs.	13
144"	WS-10-144-16	WS-10-144	40 lbs.	WS-12-144-16	WS-12-144	48 lbs.	WS-15-144-16	WS-15-144	55 lbs.	WS-18-144-16	WS-18-144	66 lbs.	14

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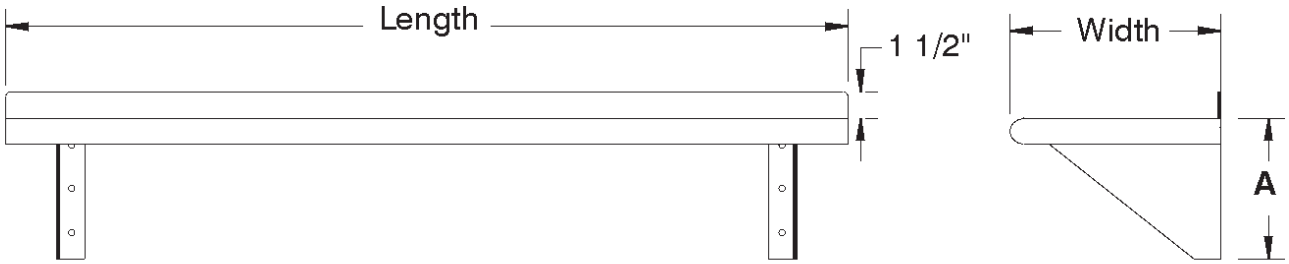
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DETAILS and SPECIFICATIONS

11 40 01-349

TOL ± .500”

ALL DIMENSIONS ARE TYPICAL



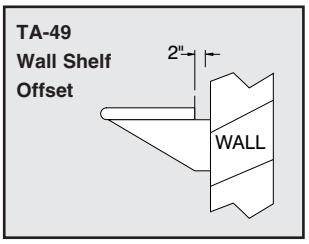
Width	A
10”	8 1/2”
12”	10 1/2”
15”	13 1/2”
18”	16 1/2”

Load Capacity = 20 lbs. per sq. ft.

(Evenly Distributed Weight)

Wall Shelf Options

PRT-1	Printer Shelf
TA-22A	Square Edge Shelf
TA-26	Welded Shelf Brackets
TA-49	Wall Shelf 2” Offset
TA-71	Heat Lamp Provision
TA-77	Check Minder
TA-77A	Concealer for Heat Lamp (Requires TA-77)
TA-99A	14 Ga. S/S 304 Upgrade for Overshelves
TA-100A	Bullnose Edge On All 4 Sides of Shelf
TA-102	6” Cantilever Shelf Offset





ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, JANUARY 2022

11 40 01-350

Submittal Sheet

09/15/2026

ITEM# 2.46 - TWO COMPARTMENT SINK (1 EA REQ'D)

Advance Tabco FS-2-1824-24RL

Fabricated Sink, 2-compartment, 24" right & left drainboards, bowl size 18" x 24" x 14" deep, 14 gauge 304 stainless steel, tile edge splash, rolled edge, 8" OC faucet holes, stainless steel legs with adjustable side cross-bracing, 1" adjustable stainless steel bullet feet, overall 29-1/2" F/B x 84" L/R, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	2	K-15	Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections
Advance Tabco	2	K-4	Support Bracket, for lever waste drain handle, (1) support required for each lever drain
Advance Tabco	2	K-450	Extend drainboard length, (per linear foot. Drainboards exceeding 36” in length with not have a crease or pitch)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

11 40 01-351

SPECLINE 14 Ga. Fabricated Sinks

Double Compartments



FS-2-1818-18RL Shown

Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edge For Additional Strength



FS-2-1818 Shown



FS-2-1818-18R Shown

FEATURES:

Full Skirt Design

Backsplash has tile edge for ease of installation.

Sink bowls are 3/4" coved corner and meet NSF requirements.

Rolled Rim Edge for additional strength.

Sink Bowls are 14" deep for greater capacity.

Stainless Steel Legs with adjustable stainless steel bullet feet.

Adjustable front-to-back cross-bracing.

CONSTRUCTION:

All TIG welded.

Welded areas blended to match adjacent surfaces and to a satin finish.

MATERIAL:

1 5/8" diameter stainless steel legs with 1" adjustable stainless steel bullet feet.

Entire unit is 14 gauge 304 stainless steel.

Stainless Steel Gussets.

MECHANICAL:

- Supply is 1/2" IPS hot & cold.
- Faucet holes on 8" centers.
- Faucets are not included **(see accessories)**.
- Waste drains are 1 1/2" IPS S/S basket type, located in center of sink bowl, and are included.

MODEL #	BOWL SIZE	O.A. Length	# of Drbds.
FS-2-1620	16" x 20"	37"	0
FS-2-1620-18RorL	16" x 20"	52.5"	1
FS-2-1620-18RL	16" x 20"	68"	2
FS-2-1524	15" x 24"	35"	0
FS-2-1524-24RorL	15" x 24"	56.5"	1
FS-2-1524-24RL	15" x 24"	78"	2
FS-2-1818	18" x 18"	41"	0
FS-2-1818-18RorL	18" x 18"	56.5"	1
FS-2-1818-18RL	18" x 18"	72"	2
FS-2-1824	18" x 24"	41"	0
FS-2-1824-18RorL	18" x 24"	56.5"	1
FS-2-1824-24RorL	18" x 24"	62.5"	1
FS-2-1824-18RL	18" x 24"	72"	2
FS-2-1824-24RL	18" x 24"	84"	2
FS-2-2024	20" x 24"	45"	0
FS-2-2424	24" x 24"	53"	0
FS-2-2424-18RorL	24" x 24"	68.5"	1
FS-2-2424-24RorL	24" x 24"	74.5"	1
FS-2-2424-18RL	24" x 24"	84"	2
FS-2-2424-24RL	24" x 24"	96"	2
FS-2-2030-18RorL	20" x 30"	60.5"	1
FS-2-2030-18RL	20" x 30"	76"	2
FS-2-2030-24RorL	20" x 30"	66.5"	1
FS-2-2030-24RL	20" x 30"	88"	2
FS-2-3024	30" x 24"	65"	0
FS-2-3024-24RorL	30" x 24"	86.5"	1
FS-2-3024-24RL	30" x 24"	108"	2

ACCESSORIES	Model #	Qty
DRAINS		
FAUCETS		

OPTIONAL MODIFICATIONS:

K-450	Extend Drainboard Length *(Drainboards over 36" Are Not Creased or Pitched.)*
K-470	Modify Bowl Depth

See our full line of Modifications & Accessories on the web!

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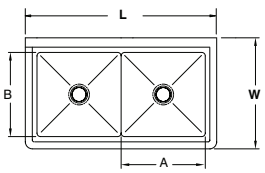
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DIMENSIONS and SPECIFICATIONS

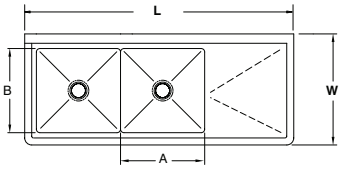
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TOL Overall: ± .500”
Interior: ± .250”

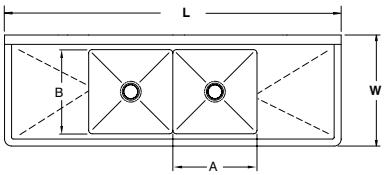
ALL DIMENSIONS ARE TYPICAL



2 COMP - NO DRBDS



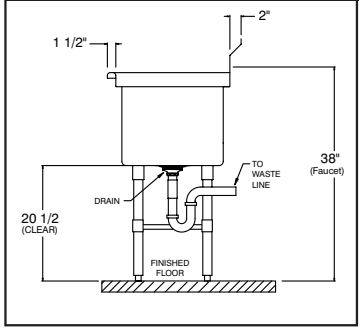
2 COMP - 1 DRBD



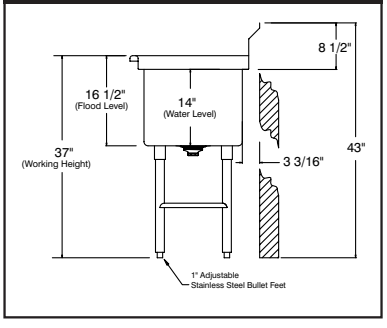
2 COMP - 2 DRBDS

MODEL #	Length L	Width W	Bowl Size A & B	Drbd. Length C	# of Drbds.	Drbd. Location	Wt	Cu.
FS-2-1620	37”	26”	16” x 20”	0	0	None	100 lbs	20
FS-2-1620-18R or L	52.5”	26”	16” x 20”	18”	1	Specify	120 lbs	27
FS-2-1620-18RL	68”	26”	16” x 20”	18”	2	Both	143 lbs	34
FS-2-1524	35”	30”	15” x 24”	0	0	None	93 lbs	23
FS-2-1524-24R or L	56.5”	30”	15” x 24”	24”	1	Specify	115 lbs	41
FS-2-1524-24RL	78”	30”	15” x 24”	24”	2	Both	130 lbs	47
FS-2-1818	41”	24”	18” x 18”	N/A	0	None	98 lbs	18
FS-2-1818-18RorL	56.5”	24”	18” x 18”	18”	1	Specify	110 lbs	26
FS-2-1818-18RL	72”	24”	18” x 18”	18”	2	Both	125 lbs	30
FS-2-1824	41”	30”	18” x 24”	0	0	None	149 lbs	26
FS-2-1824-18R or L	56.5”	30”	18” x 24”	18”	1	Specify	169 lbs	35
FS-2-1824-24R or L	62.5”	30”	18” x 24”	24”	1	Specify	190 lbs	39
FS-2-1824-18RL	72”	30”	18” x 24”	18”	2	Both	220 lbs	44
FS-2-1824-24RL	84”	30”	18” x 24”	24”	2	Both	240 lbs	51
FS-2-2024	45”	30”	20” x 24”	0	0	None	169 lbs	28
FS-2-2424	53”	30”	24” x 24”	0	0	None	179 lbs	33
FS-2-2424-18R or L	68.5”	30”	24” x 24”	18”	1	Specify	200 lbs	42
FS-2-2424-24R or L	74.5”	30”	24” x 24”	24”	1	Specify	220 lbs	46
FS-2-2424-18RL	84”	30”	24” x 24”	18”	2	Specify	245 lbs	51
FS-2-2424-24RL	96”	30”	24” x 24”	24”	2	Specify	270 lbs	58
FS-2-2030-18R or L	60.5”	36”	20” x 30”	18”	1	Specify	250 lbs	45
FS-2-2030-18RL	76”	36”	20” x 30”	18”	2	Both	260 lbs	54
FS-2-2030-24R or L	66.5”	36”	20” x 30”	24”	1	Specify	255 lbs	48
FS-2-2030-24RL	88”	36”	20” x 30”	24”	2	Both	270 lbs	61
FS-2-3024	65”	30”	30” x 24”	0	0	None	265 lbs	40
FS-2-3024-24R or L	86.5”	30”	30” x 24”	24”	1	Specify	300 lbs	52
FS-2-3024-24RL	108”	30”	30” x 24”	24”	2	Both	320 lbs	64

PLUMBING ROUGH-IN



SECTION



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Dishtable Modifications & Accessories



DTA-95



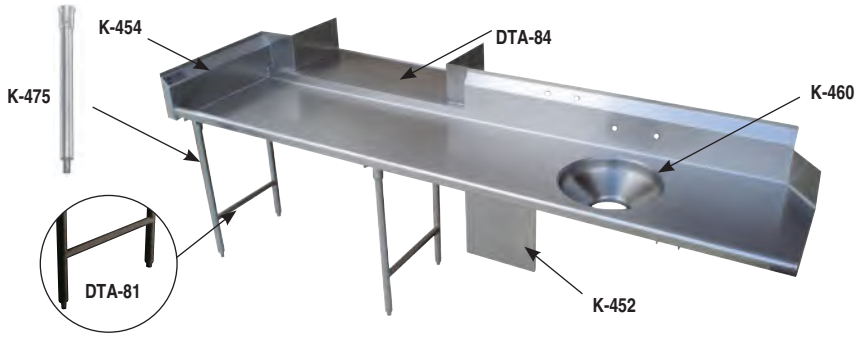
DTA-87



DTA-82



DTA-45



MODIFICATIONS

K-23	Welded Set-Up/Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Hole
K-57	Welded Field Joint (Welded In Field By Others)
K-76	Paint On Sound Deadening
K-77	Splash Cut-Out (Pipe Chase)
K-440	Waste Trough Installation Welded Into Table And Furnished With A 2" Deep Removable Basket
K-452	Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-454	Side Splash
K-456	Scrap Block Installed (Includes Rubber Scrap Block)
K-460	Disposal Cone Welded Into Table And Furnished With 8" x 12" Control Bracket & Faucet Holes (Supplied By Others)
K-460A	Installation Of Disposal Cone With 14" x 16" Control Bracket, Faucet Holes (Cone Supplied By Others)
K-461	Disposal Collar Welded Into Sink Bowl And Furnished With 8" x 12" Control Bracket (Supplied By Others)
K-461A	Disposal Collar Welded Into Sink Bowl And Furnished With 14" x 16" Control Bracket (Supplied By Others)
K-472	Special Faucet Hole Location
K-495	Turn Down Backsplash (Incl. 2 Brackets. See K-397 For Addt'l Sets)
K-508A	Special Modification Charge
K-550	Stainless Steel Tubular Rack Storage
DTA-40	Drain Hole (For Sorting Table)
DTA-45	Scrap Trough Welded To Dump Sink - Min. Scrap Trough Length Is 3'. Max. Length Is 8'. For 20" x 20" x 8" Bowl Spec-Line Soil S30 Series Only. - Consult Factory For Trough Lengths Exceeding 8 Feet
DTA-46	Inside Mitered Corner
DTA-66	Provision For Dishlanding On Straight Soil Table (Min 4')
DTA-70	Install Booster Heater Brackets (Brackets By Others)
DTA-72	Provision For Side Loader
DTA-75	Provision For Limit Switch (Limit Switch By Others)
DTA-76	Move Prerinse Sink To Conform To Dishmachine Requirements. Please Specify Machine When Placing Order
DTA-78	Notch In Backsplash Return To Clear Handle Please Specify Machine When Placing Order
DTA-81	S/S Welded Leg Assembly with S/S Feet
DTA-82	15" x 20" x 8" Undercounter Dump Sink
DTA-84	Simple Pass-Thru (Specify Wall Thickness - Min. Length 36")
DTA-87	Pass-Thru Wall Frame (Specify Wall Thickness - Min. Length 36")
DTA-95	Install Scrapper Top
DTA-96	Install Trough Collector
DTA-99A	16" x 20" x 12" Sink Bowls
DTA-99B	20" x 20" x 12" Sink Bowls
DTA-99C	10" x 14" x 5" Dump Sink
DTA-99D	18" x 24" x 14" Sink
DTA-99E	24" x 24" x 14" Sink
DTA-106	Mirror Highlight To Dishtable Upgrade

ACCESSORIES

K-4	Lever Drain Bracket
K-5	Twist Handle Operated Drain
K-15	Twist Handle Operated Drain With Overflow
K-397	Wall Brackets (2 Each. Brackets Included With K-495)
K-455C	Stainless Steel Sink Cover 16" x 20"
K-455E	Stainless Steel Sink Cover 20" x 20"
K-457	Replacement Rubber Scrap Block (See K-456 For Install Cost)
K-475	Replacement S/S Leg With Stainless Steel Bullet Foot
K-478	Replacement Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-550	Stainless Steel Tubular Rack Storage
K-610	Perforated Stainless Steel Sink Grid (Specify Bowl Size)
K-700D	12" High Removable Side Splash For Dishtables (Specify Model)
DTA-53	SPEC-LINE Heavy Duty Prerinse Faucet
DTA-51	Pre-Rinse Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-52	Pre-Rinse Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-55	Column Notch (Includes Splash)
DTA-56	Addt'l Length On 59" Side Of Corner Or Straight Tables
DTA-58	Pre-Rinse Basket w/ Slide Bar for 18" x 24" Fab. Sink Bowls
DTA-59	Pre-Rinse Basket w/ Slide Bar for 24" x 24" Fab. Sink Bowls
DTA-60	Prerinse Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-62	Prerinse Basket For 20" x 20" Deep Drawn Bowls
DTA-63	Prerinse Slide Bar For 20" x 20" Deep Drawn Bowls
DTA-64	Prerinse Slide Bar For 16" x 20" Fab. Sink Bowls
DTA-65	Prerinse Slide Bar For 16" x 20" Deep Drawn Bowls
DTA-67	Stainless Steel Rear Cross-Bracing (Factory Installed Only)
DTA-69	Prerinse Basket For 16" x 20" Deep Drawn Bowls
DTA-100	Prerinse Basket with Slide Bar for 20" x 20" Fab. Sink Bowls
DTA-125	Prerinse Basket with Slide Bar for 16" x 20" Fab. Sink Bowls
DTA-125A	Perforated Basket for DTA-82 Dump Sink

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ADDITIONAL DISHTABLE ACCESSORIES

For More Faucet Options & Faucet Specs,
See Faucet Specifications

⚠ WARNING: 11 40 01-354
Faucet(s) on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

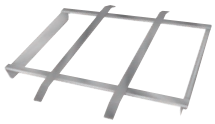
Prerinse Baskets with Welded Slide Bar For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-125	16" x 20" x 4"	9 lbs.	1
DTA-100	20" x 20" x 4"	12 lbs.	1
	Large Size Baskets		
DTA-58	18" x 24" x 4"	11 lbs.	1
DTA-59	24" x 24" x 4"	20 lbs.	1


DTA-100 Shown

Prerinse Slide Bars For Fabricated Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-64	16" x 20"	7 lbs.	1
DTA-60	20" x 20"	9 lbs.	1
	Large Size Prerinse Slide Bars		
DTA-51	18" x 24"	8 lbs.	1
DTA-52	24" x 24"	10 lbs.	1



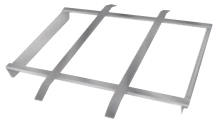
Prerinse Baskets with Welded Slide Bar For Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-69	16" x 20" x 4"	9 lbs.	1
DTA-62	20" x 20" x 4"	12 lbs.	1


DTA-62 Shown

Prerinse Slide Bars for Deep Drawn Bowls

Model #	Fits Bowls	Wt.	Cu.
DTA-65	16" x 20"	7 lbs.	1
DTA-63	20" x 20"	9 lbs.	1



Splash Mounted Faucet EXTRA HEAVY DUTY

K-119
8" O.C.

16" Spout



Splash Mounted Faucet

K-101
8" O.C.

8" Spout



SPEC-LINE EXTRA HEAVY DUTY

Prerinse Faucet

DTA-53
8"O.C.

Wall Bracket Included

Splash Mounted

Interchangeable with T&S Brand Faucets T&S Equivalent = B133-B



Prerinse Faucet

T&S

K-116
8"O.C.

Wall Bracket Included

Splash Mtd.



Add-A-Faucet for DTA-53 Prerinse Faucet K-117



Add-A-Faucet for K-116 Prerinse Faucet K-117-TS



Stainless Steel Sink Compartment Covers

K-455
16" x 20" Cover
or
20" x 20"
Specify Size



Lever Operated Drain

K-5


Twist Handle 2" IPS

Lever Drain Support Bracket

K-4



INDIVIDUAL Stainless Steel Legs with Stainless Steel Adjustable Bullet Feet

K-475



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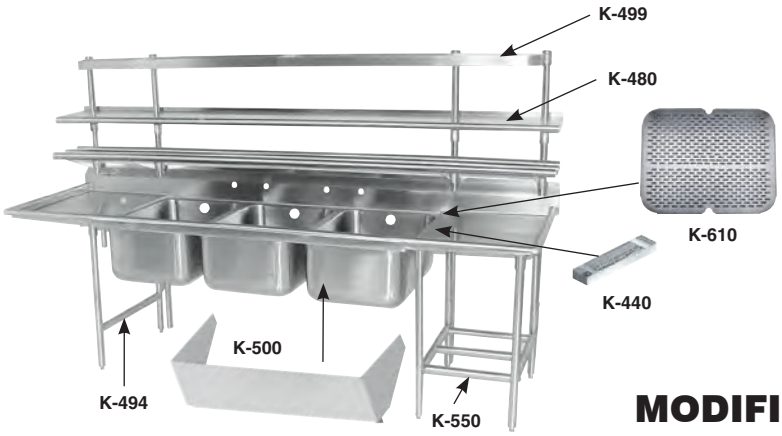
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SINK MODIFICATIONS & ACCESSORIES

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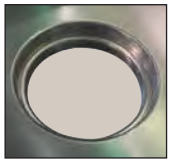
K-37 Anti-Siphon Vacuum Braker Holes



K-72 Leg-To-Wall Brace



K-460A Disposal Cone w/ Control Bracket & Faucet Holes



K-461A Install Collar w/ Control Bracket

MODIFICATIONS

K-4	Support Bracket for Lever Waste Drain Handle
K-23	Sink Legs Welded To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated. (Top Is Not Welded To Legs)
K-23A	Sink Legs Welded To Leg Gussets Under Sink Top & To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Holes
K-57	Welded field Joint *(Welded in field by others)*
K-76	Paint on Sound Deadening
K-77	Splash Cutout (Pipe Chase)
K-106	Mirror Highlite Edge for Sink
K-440	Waste Trough with 2" deep removable basket
K-447	High Backsplash up to 18"
K-448	High Backsplash up to 13"
K-450	Extra Drainboard
K-451	Drainboard Corner Turn
K-452	Control Bracket 8" x 12"
K-452S	Splash Mounted Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-453S	Splash Mounted Control Bracket 14" x 16"
K-454	Sidesplash
K-456	Scrap Block Installed
K-460	Installation of Disposal Cone with 8" x 12" Control Bracket, Faucet Holes *(Cone supplied by others)*
K-460A	Installation of Disposal Cone with 14" x 16" Control Bracket, Faucet Holes *(Cone supplied by others)*

K-461	Install Collar with 8" x 12" control bracket *(Collar by others)*
K-461A	Install Collar with 14" x 16" control bracket *(Collar by others)*
K-470	Modify Bowl Depth
K-472	Faucet Hole Revision
K-473	Working Height Revision
K-476	Punch for Over Flow Holes *(Holes Only. N/C when ordering K-15)*
K-479	Undershelf Under Drainboard
K-480	Stainless Steel 12" Wide Shelf *(min. of 3 ft.)*
K-480A	Stainless Steel 15" Wide Shelf *(min. of 3 ft.)*
K-490	Provision for Pot Washer *(For "Wells-PW-106" only)*
K-491	Provision for Hatco Heater
K-495	Turn Down Backsplash *(Includes 2 Brackets. See K-397 Addt'l Sets)*
K-498	Tubular Overshelf 12" wide (Min. 3 Ft.)
K-499	Stainless Steel Pot Rack
K-500	Stainless Steel Apron to Cover Sink Bowls
K-500A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
K-508	Special Sizing Charge (Larger size cut down to smaller size
K-508A	Special Modification Charge
K-510	Prepare Sink for Undercounter Dishwasher *(24" drainboard or larger)*
K-520	Poly Board/Stainless Steel Cover Holder
K-550	Stainless Steel Tubular Rack Storage
K-ROD	Weld Support Rods For Poly Sink Cover In Corners Of Sink Bowl

ACCESSORIES

K-30	Faucet Wall Mounting Bracket
K-72	Leg To Wall Brace
K-350	Residential Finish & Packaging
K-397	Wall Brackets for Sink *(Brackets Included with K-495)*
K-457	Replacement Rubber Scrap Block *(See K-456 for install cost)*
K-474	16 ga., '304' Series S/S Leg with S/S Foot
K-475	S/S Legs with S/S Foot
K-477	Replacement Leg Clamp For Adjustable Cross-Bracing
K-477C	Replacement Corner Leg Clamp For Adjustable Cross-Bracing
K-478	Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-493	16 ga., '304' Series S/S Welded Leg Assembly with S/S Feet
K-494	S/S Welded Leg Assembly with S/S Feet
K-497	Galv. Welded Leg Assembly with Plastic Feet
K-497A	Galv. Individual Legs with Plastic Feet
K-496	Leg Assembly For Grease Interceptor w/ Adj. Cross-Bracing & S/S Feet *(For Grease Interceptors with 15" Ht. or less. Consult factory for larger Grease Interceptors)*
K-610	Perforated Stainless Steel Sink Grid *(Specify Bowl Size)*

SINK COVERS

Choose Model # & Add The Proper Letter In Place Of The Underscore (_).
Example: K-2A or FC-455H

	FOR DEEP DRAWN BOWLS		FOR FABRICATED BOWLS	
Bowl Size	**Poly Covers Model K-2_**	**S/S Covers Model K-455_**	**Poly Covers Model K-2_**	**S/S Covers Model FC-455_**
10" x 14"	A	A	AF	A
12" x 20"	I	I	IF	I
14" x 14"	H	H	HF	H
14" x 16"	B	B	BF	B
15" x 15"	Not Available	Not Available	MF	M
15" x 24"	Not Available	Not Available	UF	U
16" x 20"	C	C	CF	C
18" x 18"	Not Available	Not Available	JF	J
18" x 24"	D	D	DF	D
20" x 20"	E	E	EF	E
20" x 24"	Not Available	Not Available	PF	P
20" x 28"	G	G	GF	G
20" x 30"	Not Available	Not Available	SF	S
24" x 30"	Not Available	Not Available	TF	T
24" x 24"	F	F	FF	F
24" x 36"	Not Available	Not Available	RF	R
30" x 30"	Not Available	Not Available	VF	V

Custom Covers Available. Consult Factory.

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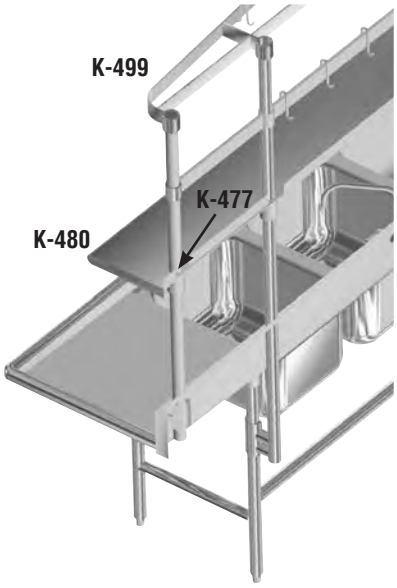
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POT RACK & TUBULAR OVERSHELF DETAILS AND SPECIFICATIONS

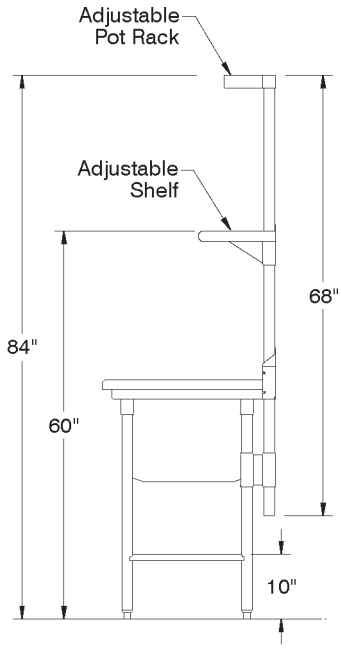
ADJUSTABLE POT RACK & SHELF



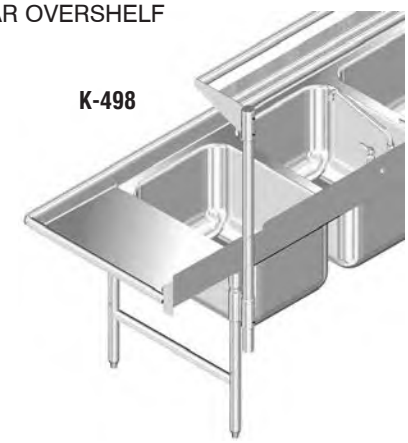
Item #: _____ Qty #: _____

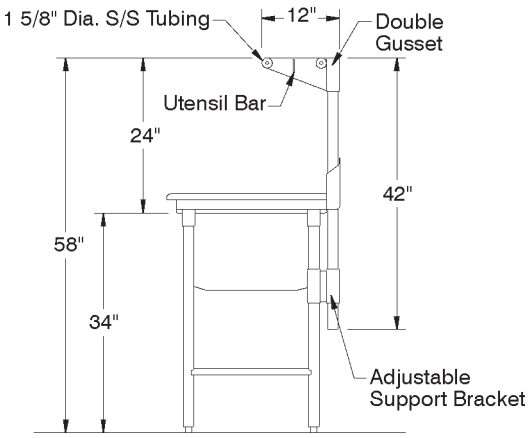
Model #: _____

Project #: _____

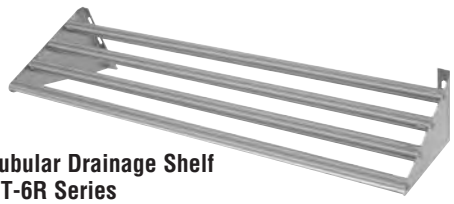


TUBULAR OVERSHELF





Model #	Description	Qty
K-477	Mounting Provision for Sink Mounted Pot Rack or Shelf	
K-480	12” Wide Stainless Steel Shelf	
K-498	Tubular Overshelf (min. 3 ft.)	
K-499	Stainless Steel Pot Rack	
DT-6R-36	3’ Tubular Wall Mounted Drainage Shelf	
DT-6R-48	4’ Tubular Wall Mounted Drainage Shelf	
DT-6R-60	5’ Tubular Wall Mounted Drainage Shelf	
DT-6R-72	6’ Tubular Wall Mounted Drainage Shelf	



Tubular Drainage Shelf
DT-6R Series

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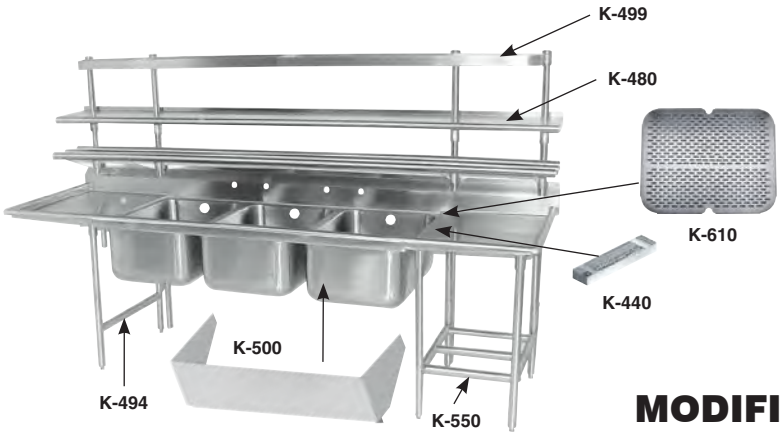
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SINK MODIFICATIONS & ACCESSORIES

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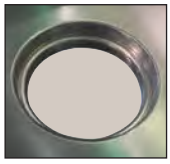
K-37 Anti-Siphon Vacuum Braker Holes



K-72 Leg-To-Wall Brace



K-460A Disposal Cone w/ Control Bracket & Faucet Holes



K-461A Install Collar w/ Control Bracket

MODIFICATIONS

K-4	Support Bracket for Lever Waste Drain Handle
K-23	Sink Legs Welded To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated. (Top Is Not Welded To Legs)
K-23A	Sink Legs Welded To Leg Gussets Under Sink Top & To Undershelf Or Left-To-Right Cross Rails, Shipped Set Up & Crated
K-24	Shell Crating
K-37	Anti-Siphon Vacuum Breaker Holes
K-57	Welded field Joint *(Welded in field by others)*
K-76	Paint on Sound Deadening
K-77	Splash Cutout (Pipe Chase)
K-106	Mirror Highlite Edge for Sink
K-440	Waste Trough with 2" deep removable basket
K-447	High Backsplash up to 18"
K-448	High Backsplash up to 13"
K-450	Extra Drainboard
K-451	Drainboard Corner Turn
K-452	Control Bracket 8" x 12"
K-452S	Splash Mounted Control Bracket 8" x 12"
K-453	Control Bracket 14" x 16"
K-453S	Splash Mounted Control Bracket 14" x 16"
K-454	Sidesplash
K-456	Scrap Block Installed
K-460	Installation of Disposal Cone with 8" x 12" Control Bracket, Faucet Holes *(Cone supplied by others)*
K-460A	Installation of Disposal Cone with 14" x 16" Control Bracket, Faucet Holes *(Cone supplied by others)*

K-461	Install Collar with 8" x 12" control bracket *(Collar by others)*
K-461A	Install Collar with 14" x 16" control bracket *(Collar by others)*
K-470	Modify Bowl Depth
K-472	Faucet Hole Revision
K-473	Working Height Revision
K-476	Punch for Over Flow Holes *(Holes Only. N/C when ordering K-15)*
K-479	Undershelf Under Drainboard
K-480	Stainless Steel 12" Wide Shelf *(min. of 3 ft.)*
K-480A	Stainless Steel 15" Wide Shelf *(min. of 3 ft.)*
K-490	Provision for Pot Washer *(For "Wells-PW-106" only)*
K-491	Provision for Hatco Heater
K-495	Turn Down Backsplash *(Includes 2 Brackets. See K-397 Addt'l Sets)*
K-498	Tubular Overshelf 12" wide (Min. 3 Ft.)
K-499	Stainless Steel Pot Rack
K-500	Stainless Steel Apron to Cover Sink Bowls
K-500A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
K-508	Special Sizing Charge (Larger size cut down to smaller size
K-508A	Special Modification Charge
K-510	Prepare Sink for Undercounter Dishwasher *(24" drainboard or larger)*
K-520	Poly Board/Stainless Steel Cover Holder
K-550	Stainless Steel Tubular Rack Storage
K-ROD	Weld Support Rods For Poly Sink Cover In Corners Of Sink Bowl

ACCESSORIES

K-30	Faucet Wall Mounting Bracket
K-72	Leg To Wall Brace
K-350	Residential Finish & Packaging
K-397	Wall Brackets for Sink *(Brackets Included with K-495)*
K-457	Replacement Rubber Scrap Block *(See K-456 for install cost)*
K-474	16 ga., '304' Series S/S Leg with S/S Foot
K-475	S/S Legs with S/S Foot
K-477	Replacement Leg Clamp For Adjustable Cross-Bracing
K-477C	Replacement Corner Leg Clamp For Adjustable Cross-Bracing
K-478	Stainless Steel Bullet Foot
K-488	Flanged S/S Bullet Foot
K-493	16 ga., '304' Series S/S Welded Leg Assembly with S/S Feet
K-494	S/S Welded Leg Assembly with S/S Feet
K-497	Galv. Welded Leg Assembly with Plastic Feet
K-497A	Galv. Individual Legs with Plastic Feet
K-496	Leg Assembly For Grease Interceptor w/ Adj. Cross-Bracing & S/S Feet *(For Grease Interceptors with 15" Ht. or less. Consult factory for larger Grease Interceptors)*
K-610	Perforated Stainless Steel Sink Grid *(Specify Bowl Size)*

SINK COVERS

Choose Model # & Add The Proper Letter In Place Of The Underscore (_).
Example: K-2A or FC-455H

	FOR DEEP DRAWN BOWLS		FOR FABRICATED BOWLS	
Bowl Size	**Poly Covers Model K-2_**	**S/S Covers Model K-455_**	**Poly Covers Model K-2_**	**S/S Covers Model FC-455_**
10" x 14"	A	A	AF	A
12" x 20"	I	I	IF	I
14" x 14"	H	H	HF	H
14" x 16"	B	B	BF	B
15" x 15"	Not Available	Not Available	MF	M
15" x 24"	Not Available	Not Available	UF	U
16" x 20"	C	C	CF	C
18" x 18"	Not Available	Not Available	JF	J
18" x 24"	D	D	DF	D
20" x 20"	E	E	EF	E
20" x 24"	Not Available	Not Available	PF	P
20" x 28"	G	G	GF	G
20" x 30"	Not Available	Not Available	SF	S
24" x 30"	Not Available	Not Available	TF	T
24" x 24"	F	F	FF	F
24" x 36"	Not Available	Not Available	RF	R
30" x 30"	Not Available	Not Available	VF	V

Custom Covers Available. Consult Factory.

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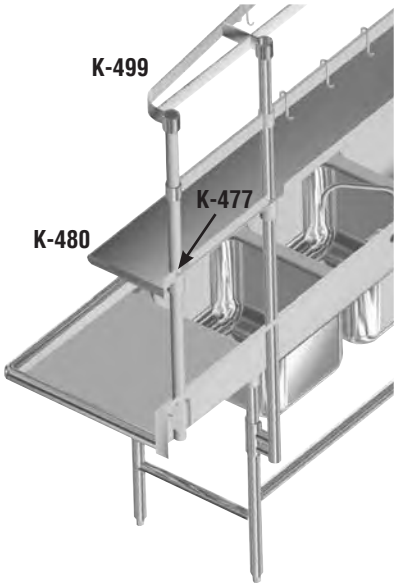
For Smart Fabrication™ Quotes:
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11 40 01-358

POT RACK & TUBULAR OVERSHELF DETAILS AND SPECIFICATIONS

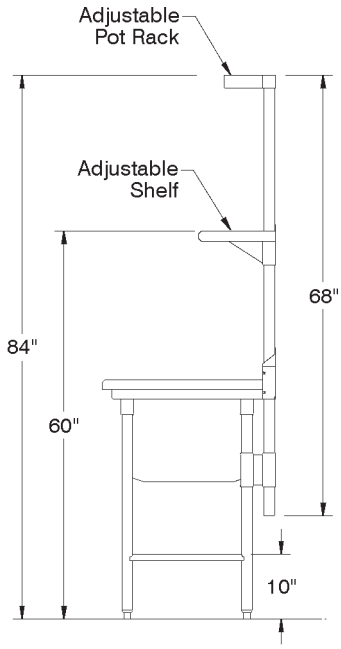
ADJUSTABLE POT RACK & SHELF



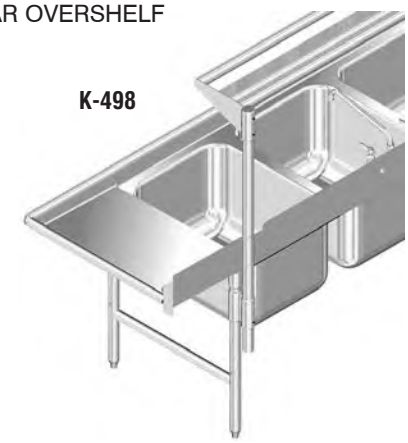
Item #: _____ Qty #: _____

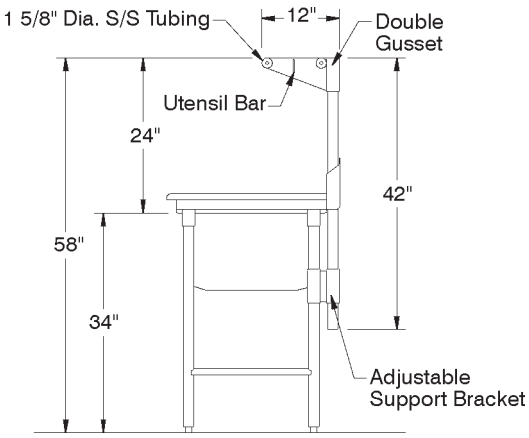
Model #: _____

Project #: _____

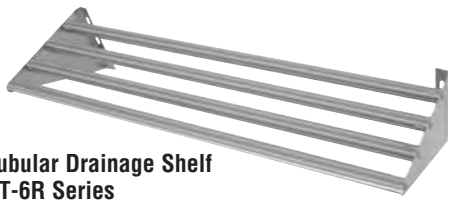


TUBULAR OVERSHELF





Model #	Description	Qty
K-477	Mounting Provision for Sink Mounted Pot Rack or Shelf	
K-480	12” Wide Stainless Steel Shelf	
K-498	Tubular Overshelf (min. 3 ft.)	
K-499	Stainless Steel Pot Rack	
DT-6R-36	3’ Tubular Wall Mounted Drainage Shelf	
DT-6R-48	4’ Tubular Wall Mounted Drainage Shelf	
DT-6R-60	5’ Tubular Wall Mounted Drainage Shelf	
DT-6R-72	6’ Tubular Wall Mounted Drainage Shelf	



Tubular Drainage Shelf
DT-6R Series

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NEVADA Fax: (775) 972-1578

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11 40 01-359

Submittal Sheet

09/15/2026

ITEM# 2.47 - SWING FAUCET, 12" (1 EA REQ'D)

T&S Brass B-0290-04

Big-Flo Mixing Faucet, wall mount, 8" adjustable centers, 12" swing nozzle with plain end outlet, 4" wrist handles with color coded indexes, low-lead, 3/4" female NPT, ANSI, NSF, ADA Compliant

T&S BRASS AND BRONZE WORKS, INC.

2 Saddleback Cove / P.O. Box 1088
Travelers Rest, SC 29690

Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

11.40.01.360

Model No.
B-0290-04

Item No.

ADA Compliant

This Space for Architect/Engineer Approval

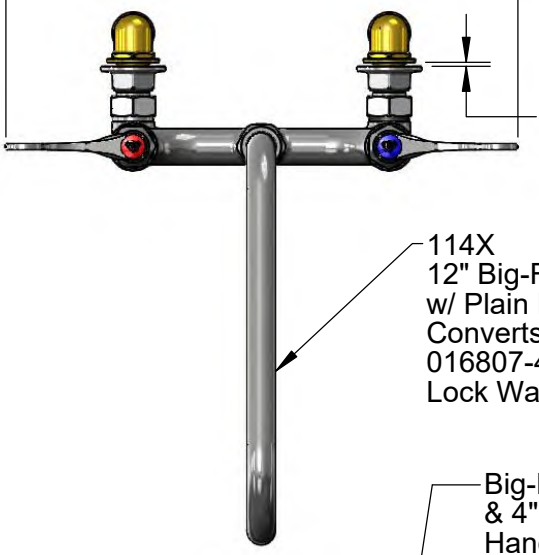
Job Name_____Date_____

Model Specified_____ Quantity_____

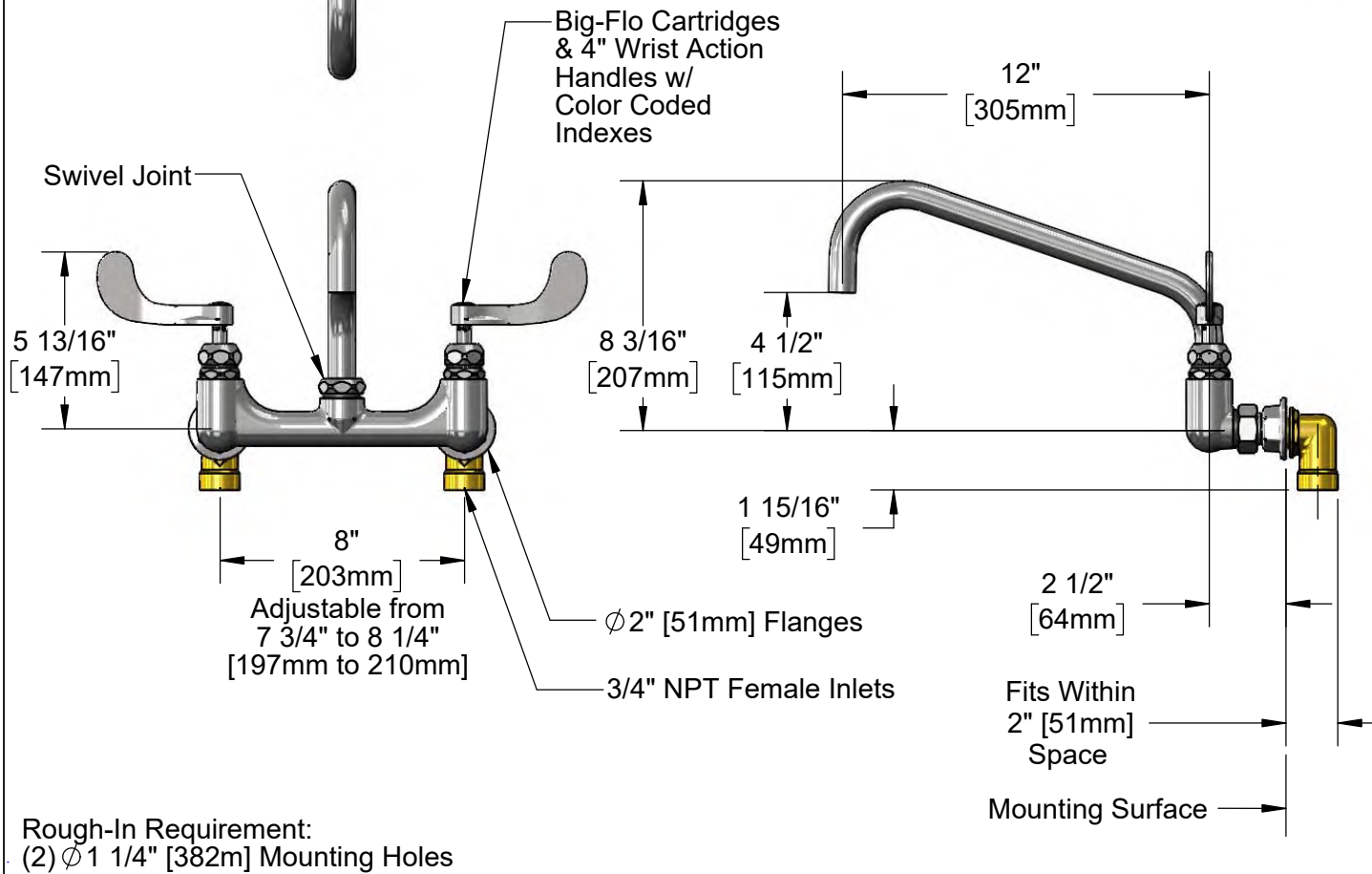
Customer/Wholesaler_____

Contractor_____

Architect/Engineer_____







Rough-In Requirement:
(2) ∅1 1/4" [382m] Mounting Holes

Product Specifications:

8" Wall Mount Big-Flo Mixing Faucet, Big-Flo Cartridges, 4" Wrist Action Handles,12" Big-Flo Swing Nozzle & 3/4" NPT Female Inlets

Product Compliance:

ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
ANSI A117.1 (ADA)

Drawn: MRC	Checked: JRM	Approved: JHB	Date: 06/15/18	Scale: 1:6	Sheet: 1 of 2

T&S BRASS AND BRONZE WORKS, INC.

2 Saddleback Cove / P.O. Box 1088
Travelers Rest, SC 29690

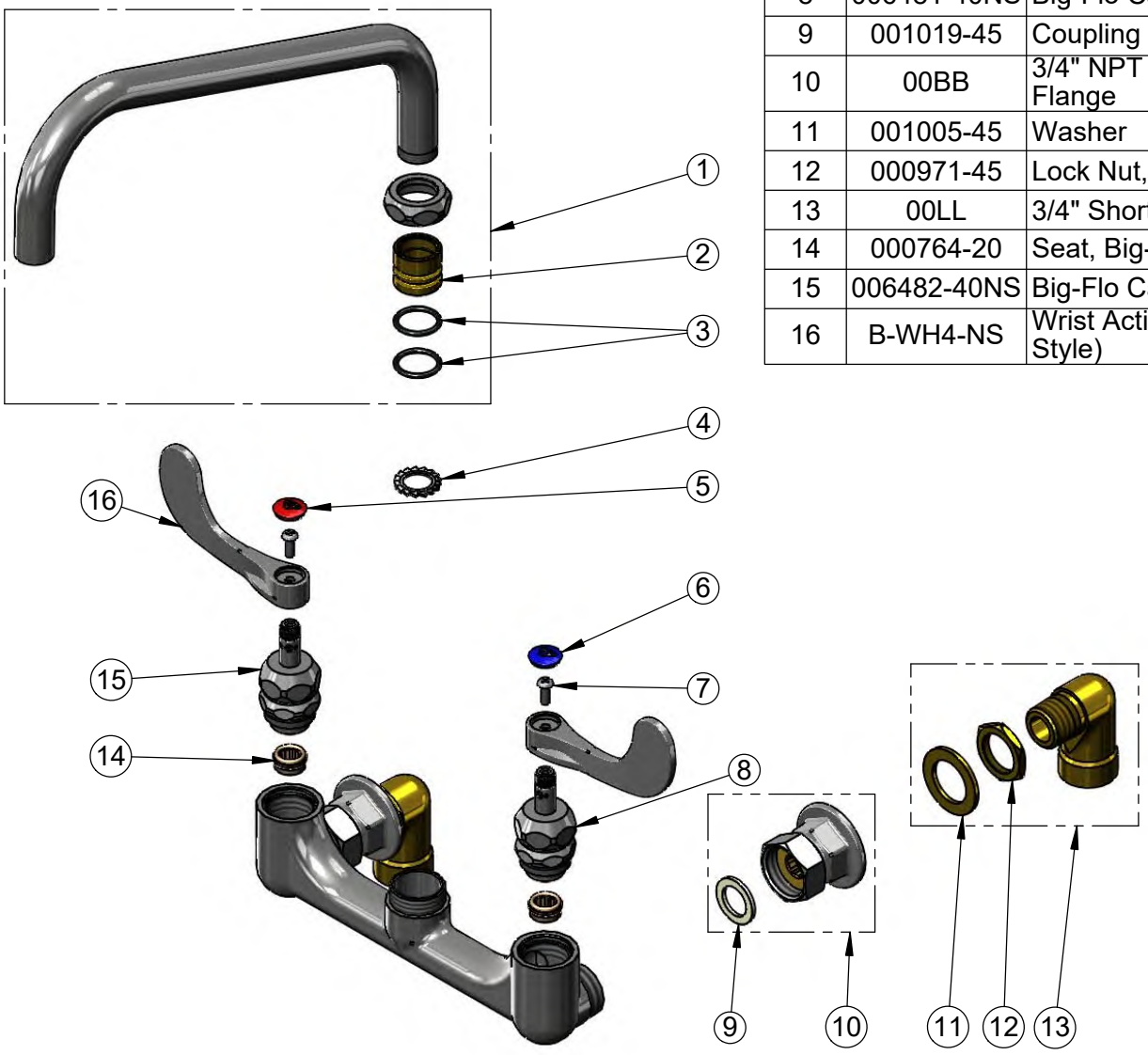
Travelers Rest, SC: 800-476-4103 • Simi Valley, CA: 800-423-0150 • Fax: 864-834-3518 • www.tsbrass.com

11.40.DN.361

Model No.
B-0290-04

Item No.

ITEM NO.	SALES NO.	DESCRIPTION
1	114X	12" Big-Flo Swing Nozzle
2	000847-20	Big-Flo Swivel Piece
3	001068-45	O-ring
4	016807-45	Serrated Lock Washer
5	001193-19NS	Red Button Index, Press-in
6	018506-19NS	Blue Button Index, Press-in
7	000925-45	Lab Handle Screw
8	006481-40NS	Big-Flo Cartridge, LTC
9	001019-45	Coupling Nut Washer
10	00BB	3/4" NPT Female Eccentric Flange
11	001005-45	Washer
12	000971-45	Lock Nut, 3/4-14 NPSM
13	00LL	3/4" Short Elbow Inlet
14	000764-20	Seat, Big-Flo
15	006482-40NS	Big-Flo Cartridge, RTC
16	B-WH4-NS	Wrist Action Handle (New Style)



Product Specifications:

8" Wall Mount Big-Flo Mixing Faucet, Big-Flo Cartridges, 4" Wrist Action Handles,12" Big-Flo Swing Nozzle & 3/4" NPT Female Inlets

Product Compliance:

ASME A112.18.1 / CSA B125.1
NSF 61 - Section 9
NSF 372 (Low Lead Content)
ANSI A117.1 (ADA)

Drawn:	Checked:	Approved:	Date:	Scale:	Sheet:
MRC	JRM	JHB	06/15/18	NTS	2 of 2

11 40 01-362

Submittal Sheet

09/15/2026

ITEM# 2.48 - WORKTABLE (2 EA REQ'D)

Advance Tabco SS-305

Work Table, 60"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	2	TA-25S-4	Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

STAINLESS STEEL

11 40 01-363

WORK TABLES

PREMIUM Series - Flat Top - UNDERSHELF Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with 1-5/8" sanitary rolled rim edges on front & back and square side edges.

To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

SS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel. 1" adjustable **stainless steel** bullet feet. Stainless steel gussets.

GLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel. 1" adjustable plastic bullet feet. Galvanized steel gussets.

SS-Series: Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	SS-240	SS-300	
24"	SS-242	SS-302	
36"	SS-243	SS-303	SS-363
48"	SS-244	SS-304	SS-364
60"	SS-245	SS-305	SS-365
72"	SS-246	SS-306	SS-366
84"	SS-247	SS-307	SS-367
96"	SS-248	SS-308	SS-368
108"	SS-249	SS-309	SS-369
120"	SS-2410	SS-3010	SS-3610
132"	SS-2411	SS-3011	SS-3611
144"	SS-2412	SS-3012	SS-3612

GLG-Series: Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	GLG-240	GLG-300	
24"	GLG-242	GLG-302	
36"	GLG-243	GLG-303	GLG-363
48"	GLG-244	GLG-304	GLG-364
60"	GLG-245	GLG-305	GLG-365
72"	GLG-246	GLG-306	GLG-366
84"	GLG-247	GLG-307	GLG-367
96"	GLG-248	GLG-308	GLG-368
108"	GLG-249	GLG-309	GLG-369
120"	GLG-2410	GLG-3010	GLG-3610
132"	GLG-2411	GLG-3011	GLG-3611
144"	GLG-2412	GLG-3012	GLG-3612

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

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DIMENSIONS and SPECIFICATIONS

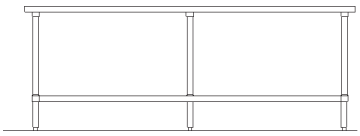
11-49-01-364

ALL DIMENSIONS ARE TYPICAL TOL ± .500”

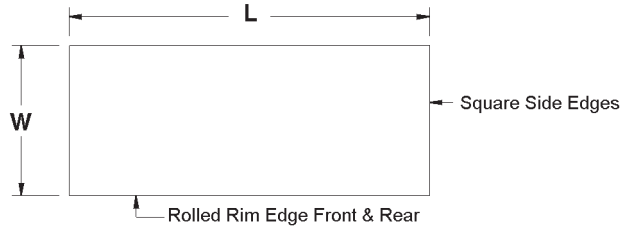
All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

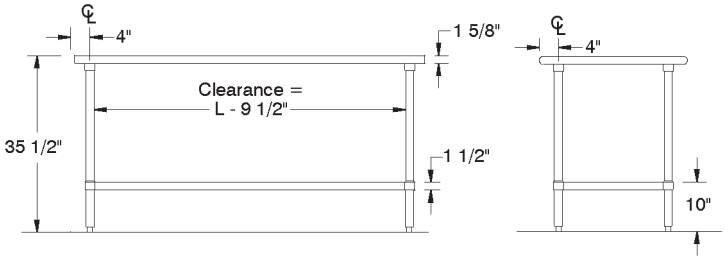
SS & GLG Series
Undershelf Style
FLAT TOP

Finished size of undershelf = Length minus 5 3/4”
Width minus 5 3/4”



Units 8 ft. and larger are furnished with six (6) legs





SS-Series: Stainless Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	SS-240	60 lbs.	SS-300	67 lbs.		
24”	SS-242	45 lbs.	SS-302	54 lbs.		
36”	SS-243	65 lbs.	SS-303	74 lbs.	SS-363	80 lbs.
48”	SS-244	78 lbs.	SS-304	92 lbs.	SS-364	100 lbs.
60”	SS-245	92 lbs.	SS-305	112 lbs.	SS-365	122 lbs.
72”	SS-246	108 lbs.	SS-306	132 lbs.	SS-366	142 lbs.
84”	SS-247	128 lbs.	SS-307	149 lbs.	SS-367	165 lbs.
96”	SS-248	158 lbs.	SS-308	175 lbs.	SS-368	195 lbs.
108”	SS-249	245 lbs.	SS-309	286 lbs.	SS-369	305 lbs.
120”	SS-2410	295 lbs.	SS-3010	333 lbs.	SS-3610	338 lbs.
132”	SS-2411	320 lbs.	SS-3011	351 lbs.	SS-3611	373 lbs.
144”	SS-2412	345 lbs.	SS-3012	379 lbs.	SS-3612	400 lbs.

GLG-Series: Galvanized Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	GLG-240	60 lbs.	GLG-300	67 lbs.		
24”	GLG-242	45 lbs.	GLG-302	54 lbs.		
36”	GLG-243	65 lbs.	GLG-303	74 lbs.	GLG-363	80 lbs.
48”	GLG-244	78 lbs.	GLG-304	92 lbs.	GLG-364	100 lbs.
60”	GLG-245	92 lbs.	GLG-305	112 lbs.	GLG-365	122 lbs.
72”	GLG-246	108 lbs.	GLG-306	132 lbs.	GLG-366	142 lbs.
84”	GLG-247	128 lbs.	GLG-307	149 lbs.	GLG-367	165 lbs.
96”	GLG-248	158 lbs.	GLG-308	175 lbs.	GLG-368	195 lbs.
108”	GLG-249	245 lbs.	GLG-309	286 lbs.	GLG-369	305 lbs.
120”	GLG-2410	295 lbs.	GLG-3010	333 lbs.	GLG-3610	338 lbs.
132”	GLG-2411	320 lbs.	GLG-3011	351 lbs.	GLG-3611	373 lbs.
144”	GLG-2412	345 lbs.	GLG-3012	379 lbs.	GLG-3612	400 lbs.

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11 40 01-365

TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



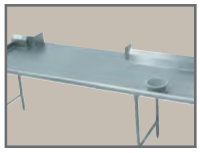
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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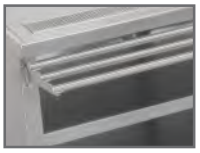
11 40 01-366

TABLE MODIFICATIONS & ACCESSORIES

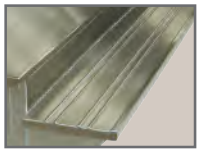
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



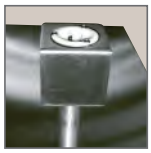
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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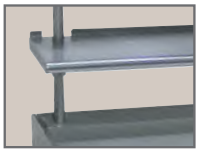
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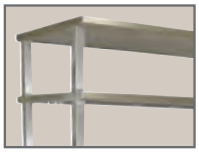
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1" Turn Up



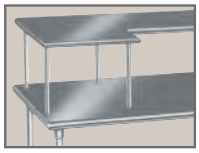
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B **Set** — For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C **Per Caster** — Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs
TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs
TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO SMART FABRICATION™

REF-K 200 Heartland Boulevard, Edgewood, NY 11717-8380

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

© ADVANCE TABCO, AUGUST 2018

11 40 01-369

Submittal Sheet

09/15/2026

ITEM# 2.49 - WORKTABLE (3 EA REQ'D)

Advance Tabco MT-SS-300

Equipment Stand, 30"W x 30"D x 24"H, 14/304 stainless steel top, 18 gauge stainless steel adjustable undershelf & legs, adjustable stainless steel bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	3	TA-25ES	Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel for 24" tall tables & mixer stands (capacity 200 lbs per caster)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL 11 40 01-370

MIXER TABLES

NSF



MX-SS-242 Shown
Mixer Not Included



MT-SS-242
Shown



AG-MT-242
Shown

Item #: _____ Qty #: _____
Model #: _____
Project #: _____

UTENSIL RACK & UNDERSHELF

	S/S Base	Galv. Base		
O.A. Size Wx L	Model	Model	Approx. Wt.	Approx. Cu. Ft.
24" x 24"	MX-SS-242	MX-GL-242	53 lbs.	3
30" x 24"	MX-SS-302	MX-GL-302	63 lbs.	3
30" x 30"	MX-SS-300	MX-GL-300	70 lbs.	4
30" x 36"	MX-SS-303	MX-GL-303	77 lbs.	4
36" x 36"	MX-SS-363	MX-GL-363	81 lbs.	5

WITH UNDERSHELF

	S/S Base	Galv. Base		
O.A. Size Wx L	Model	Model	Approx. Wt.	Approx. Cu. Ft.
24" x 24"	MT-SS-242	MT-GL-242	45 lbs.	3
30" x 24"	MT-SS-302	MT-GL-302	50 lbs.	3
30" x 30"	MT-SS-300	MT-GL-300	55 lbs.	4
30" x 36"	MT-SS-303	MT-GL-303	68 lbs.	4
36" x 36"	MT-SS-363	MT-GL-363	71 lbs.	5

BUDGET SERIES WITH UNDERSHELF

	S/S Base	Galv. Base		
O.A. Size Wx L	Model	Model	Approx. Wt.	Approx. Cu. Ft.
24" x 24"	SAG-MT-242	AG-MT-242	38 lbs.	3
30" x 24"	SAG-MT-302	AG-MT-302	41 lbs.	3
30" x 30"	SAG-MT-300	AG-MT-300	52 lbs.	4
30" x 36"	SAG-MT-303	AG-MT-303	58 lbs.	4
36" x 36"	SAG-MT-363	AG-MT-363	64 lbs.	5

FEATURES:

TOP is furnished with a 2" x 1" square die embossed NO-DRIP countertop offset edge with a 1/2" return on 4 sides.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts and bolts. Undershelf is adjustable.

MATERIAL:

MX-SS & MT-SS SERIES - Stainless Steel Base

TOP is 14 gauge stainless steel type "304" series with galvanized understructure.

UNDERSHELF is 18 gauge stainless steel.

LEGS are 1 5/8" diameter tubular stainless steel with stainless steel bullet feet & gussets.

UTENSIL RACK on MX-SS Series is 1 5/8" dia. stainless steel tubing with stainless steel hooks.

MX-GL & MT-GL Series - Galvanized Steel Base

TOP is 14 gauge stainless steel type "304" series with galvanized understructure.

UNDERSHELF is galvanized steel.

LEGS are 1 5/8" diameter, tubular galvanized steel. Gussets are galvanized steel with 1" adjustable plastic bullet feet.

UTENSIL RACK on MX-SS Series is 1 5/8" diameter galvanized steel tubing with stainless steel hooks.

SAG-MT & AG-MT Budget Series

TOP is heavy gauge stainless steel type "430" series with galvanized understructure.

SAG-MT Series UNDERSHELF is 18 gauge stainless steel.
AG-MT Series UNDERSHELF is galvanized steel.

SAG-MT Series LEGS are 1 5/8" diameter, tubular stainless steel. Gussets are stainless steel. 1" adjustable stainless steel bullet feet.

AG-MT Series LEGS are 1 5/8" diameter, tubular galvanized steel. Gussets are galvanized steel. 1" adjustable plastic bullet feet.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surface.

Entire Top is mechanically polished to a satin finish and is sound deadened. Countertop edge polished to a MIRROR FINISH.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat channels.

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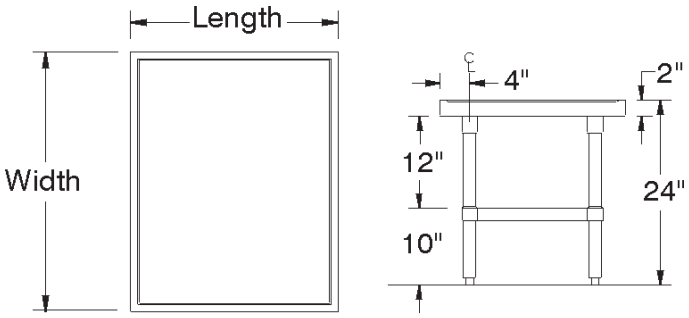
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DETAILS and SPECIFICATIONS

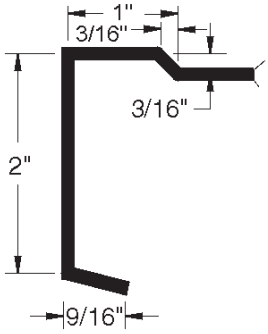
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TOL ± .500”

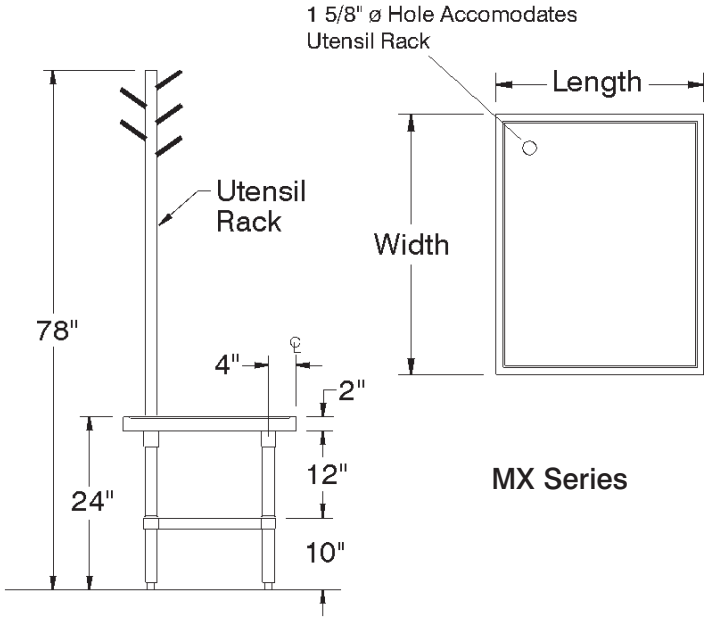
ALL DIMENSIONS ARE TYPICAL



MT, SAG & AG Series



Countertop Edge Detail



MX Series

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TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



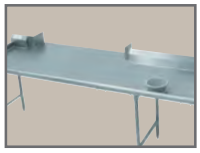
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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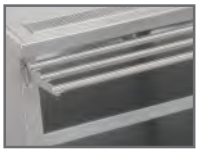
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TABLE MODIFICATIONS & ACCESSORIES

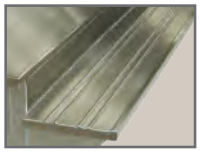
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



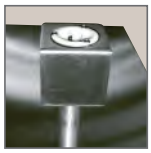
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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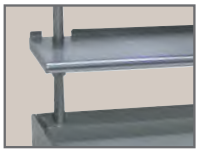
For Orders & Customer Service:
Email: customer@advancetabco.com or **Fax:** 631-242-6900

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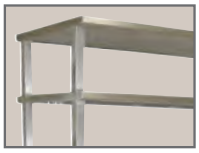
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



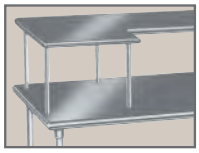
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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11 40 01-375

TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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11 40 01-376

Submittal Sheet

09/15/2026

ITEM# 2.50 - WORKTABLE (1 EA REQ'D)

Advance Tabco SS-306

Work Table, 72"W x 30"D, 14 gauge 304 stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	TA-25S-4	Casters, 5" diameter, set of 4 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

STAINLESS STEEL

11 40 01-377

WORK TABLES

PREMIUM Series - Flat Top - UNDERSHELF Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with 1-5/8" sanitary rolled rim edges on front & back and square side edges.

To reinforce and maintain a level working surface, 24" wide tables are supplied with TWO hat channels and 30" and 36" wide tables are supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts & bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

SS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel. 1" adjustable **stainless steel** bullet feet. Stainless steel gussets.

GLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel. 1" adjustable plastic bullet feet. Galvanized steel gussets.

SS-Series: Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	SS-240	SS-300	
24"	SS-242	SS-302	
36"	SS-243	SS-303	SS-363
48"	SS-244	SS-304	SS-364
60"	SS-245	SS-305	SS-365
72"	SS-246	SS-306	SS-366
84"	SS-247	SS-307	SS-367
96"	SS-248	SS-308	SS-368
108"	SS-249	SS-309	SS-369
120"	SS-2410	SS-3010	SS-3610
132"	SS-2411	SS-3011	SS-3611
144"	SS-2412	SS-3012	SS-3612

NSF

GLG-Series: Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	GLG-240	GLG-300	
24"	GLG-242	GLG-302	
36"	GLG-243	GLG-303	GLG-363
48"	GLG-244	GLG-304	GLG-364
60"	GLG-245	GLG-305	GLG-365
72"	GLG-246	GLG-306	GLG-366
84"	GLG-247	GLG-307	GLG-367
96"	GLG-248	GLG-308	GLG-368
108"	GLG-249	GLG-309	GLG-369
120"	GLG-2410	GLG-3010	GLG-3610
132"	GLG-2411	GLG-3011	GLG-3611
144"	GLG-2412	GLG-3012	GLG-3612

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

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DIMENSIONS and SPECIFICATIONS

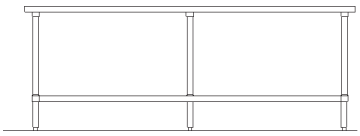
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ALL DIMENSIONS ARE TYPICAL TOL ± .500”

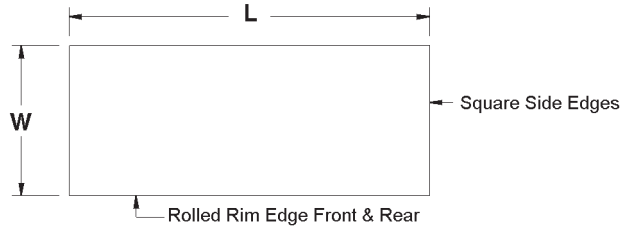
All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

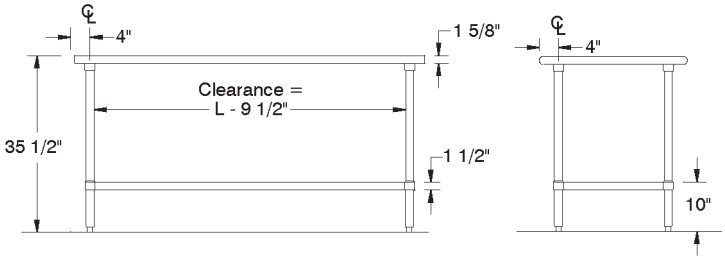
SS & GLG Series
Undershelf Style
FLAT TOP

Finished size of undershelf = Length minus 5 3/4”
Width minus 5 3/4”



Units 8 ft. and larger are furnished with six (6) legs





SS-Series: Stainless Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	SS-240	60 lbs.	SS-300	67 lbs.		
24”	SS-242	45 lbs.	SS-302	54 lbs.		
36”	SS-243	65 lbs.	SS-303	74 lbs.	SS-363	80 lbs.
48”	SS-244	78 lbs.	SS-304	92 lbs.	SS-364	100 lbs.
60”	SS-245	92 lbs.	SS-305	112 lbs.	SS-365	122 lbs.
72”	SS-246	108 lbs.	SS-306	132 lbs.	SS-366	142 lbs.
84”	SS-247	128 lbs.	SS-307	149 lbs.	SS-367	165 lbs.
96”	SS-248	158 lbs.	SS-308	175 lbs.	SS-368	195 lbs.
108”	SS-249	245 lbs.	SS-309	286 lbs.	SS-369	305 lbs.
120”	SS-2410	295 lbs.	SS-3010	333 lbs.	SS-3610	338 lbs.
132”	SS-2411	320 lbs.	SS-3011	351 lbs.	SS-3611	373 lbs.
144”	SS-2412	345 lbs.	SS-3012	379 lbs.	SS-3612	400 lbs.

GLG-Series: Galvanized Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	GLG-240	60 lbs.	GLG-300	67 lbs.		
24”	GLG-242	45 lbs.	GLG-302	54 lbs.		
36”	GLG-243	65 lbs.	GLG-303	74 lbs.	GLG-363	80 lbs.
48”	GLG-244	78 lbs.	GLG-304	92 lbs.	GLG-364	100 lbs.
60”	GLG-245	92 lbs.	GLG-305	112 lbs.	GLG-365	122 lbs.
72”	GLG-246	108 lbs.	GLG-306	132 lbs.	GLG-366	142 lbs.
84”	GLG-247	128 lbs.	GLG-307	149 lbs.	GLG-367	165 lbs.
96”	GLG-248	158 lbs.	GLG-308	175 lbs.	GLG-368	195 lbs.
108”	GLG-249	245 lbs.	GLG-309	286 lbs.	GLG-369	305 lbs.
120”	GLG-2410	295 lbs.	GLG-3010	333 lbs.	GLG-3610	338 lbs.
132”	GLG-2411	320 lbs.	GLG-3011	351 lbs.	GLG-3611	373 lbs.
144”	GLG-2412	345 lbs.	GLG-3012	379 lbs.	GLG-3612	400 lbs.

ADVANCE TABCO
SMART FABRICATION™

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11 40 01-379

TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



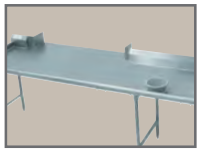
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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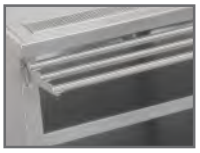
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TABLE MODIFICATIONS & ACCESSORIES

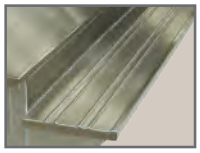
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



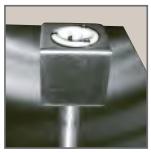
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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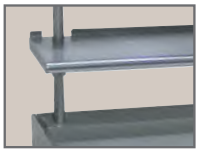
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Email: customer@advancetabco.com or **Fax:** 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

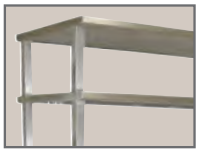
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1" Turn Up



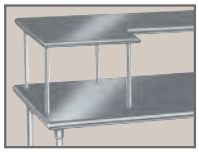
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B **Set** — For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C **Per Caster** — Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs
TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs
TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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11 40 01-383

Submittal Sheet

09/15/2026

ITEM# 2.51 - FOOD CUTTER (1 EA REQ'D)

Hobart 84145-18

Food Cutter with #12 attachment hub, 14" diameter stainless steel bowl, 22 RPM, double stainless steel knives, 1725 RPM, bowl cover with safety interlock, push/pull on/off switch, one piece burnished aluminum housing, 3" legs, 1/2 HP (available in Canada only)

HOBART

Project _____

AIA # _____ SIS # _____

Item # _____ Quantity _____ C.S.I. Section 114000

11 40 01-304

FOOD PREPARATION

84145
Food Cutter



SPECIFIER STATEMENT

Specified unit will be an NSF rated Hobart food cutter with ½ HP motor and 5-pound capacity. Unit features a 14" removable stainless steel bowl, removable stainless steel knives with stainless steel knife comb and 3" stainless steel legs with rubber feet. Bowl rotates at 22 RPMs and knives rotate at 1725 RPM simultaneously to process ingredients.

MODEL

❑ **84145** Food cutter with 14" stainless steel bowl, double cutlery grade stainless steel knives with stainless steel knife comb and 3" stainless steel legs with rubber feet. Available with or without attachment hub.

STANDARD FEATURES

+ ½ H.P. motor
+ 5-pound capacity
+ 14" stainless steel bowl
+ One-piece burnished aluminum housing
+ 1725 RPM knife rotation
+ Bowl cover interlock
+ 22 RPM bowl rotation
+ Double cutlery grade stainless steel knives
+ Pull/push on/off switch
+ 3" stainless steel legs with rubber feet
+ 6' flexible cord and plug

ACCESSORIES

❑ Vegetable Slicer

❑ Meat Chopper Attachment

84145 FOOD CUTTER

Approved by _____ Date _____ Approved by _____ Date _____

23141 SUNY Faye Corey Student Union

11 40 01-385

84145
Food Cutter

SOLUTIONS/BENEFITS

PERFORMANCE

Double Cutlery Grade Stainless Steel Knives

+ Reduces food products to a uniformly small particle size for salads, spreads, breadcrumbs and other recipes
+ Holds an edge longer, resulting in fewer sharpenings

½ H.P. Motor

+ Heavy-duty to meet the most demanding operations

EASE OF USE

Bowl and Knife Rotation

+ Bowl rotates at 22 RPM and knife rotates at 1725 RPM for easy incorporation of ingredients

SANITATION & CLEANING

Removable Bowl Cover, Knives, and Bowl

+ Easily removed without tools to be cleaned in a three-compartment sink

One-Piece Burnished Aluminum Housing

+ One-piece base has no cracks or crevices to allow food product to build up

OPERATOR ASSURANCE

Bowl Cover Interlock

+ Machine cannot be turned on until the bowl cover is locked down into position
+ Bowl cover cannot be raised with the switch in the "ON" position

SPECIFICATIONS

Electrical: 115/60/1.

Motor: ½ H.P., fan cooled, permanently lubricated ball bearings and totally enclosed within the machine. Single-phase is capacitor start, induction-run.

Switches: Single-phase is double-pole single throw. The bowl cover and switch are interlocked so that the machine cannot be turned on until the bowl cover is locked in place, nor can the bowl cover be raised with the switch in the “ON” position.

Cord and Plug: 6 foot flexible cord with plug per NEMA configuration.

Bowl: Rotates at 22 RPM. 14 15/16" inside diameter. Forged from a single sheet of stainless steel and easily removed for cleaning.

Knives: Rotate at 1725 RPM. The blades (made of special cutlery grade stainless steel) are secured to a hub as a unit, which may be removed from the knife shaft without change of knife clearance adjustment. Stainless steel knife comb included.

Base: One-piece burnished aluminum casting with plated steel bottom cover (total enclosure).

Standard Equipment: Consists of Food Cutter with 14" stainless steel bowl, cutlery grade stainless steel knives with stainless steel knife comb and 3" stainless steel legs with rubber feet.

Optional Attachment Hub: Speed – 256 RPM. Accommodates all Hobart No. 12 attachments.

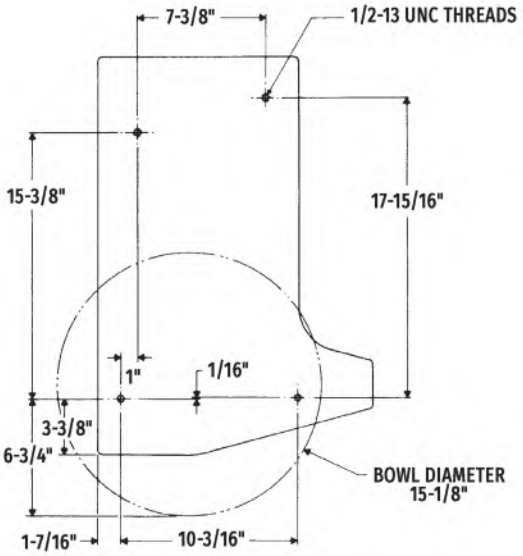
Accessories: Vegetable Slicer and Meat Chopper Attachment.

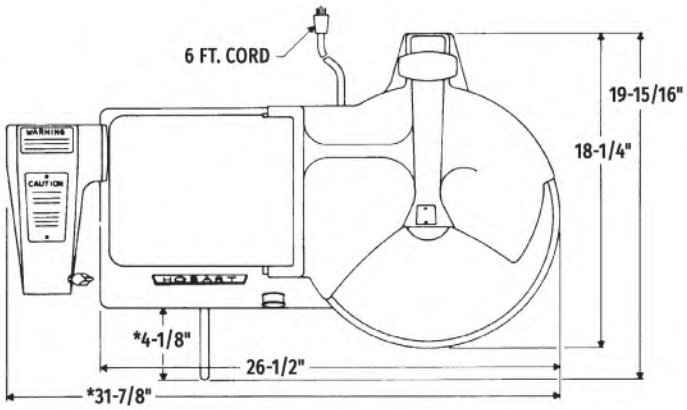
Warranty: Unit has full one-year warranty on parts, labor and mileage against manufacturer's defects. Service contracts are available.

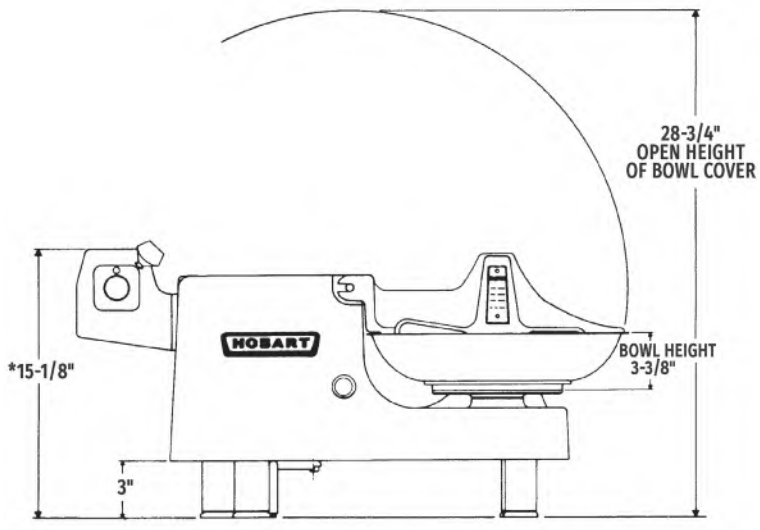
Weight: Shipping – 140 lb.; Net – 100 lb.

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84145
Food Cutter



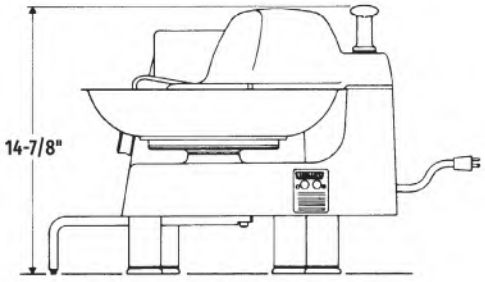




Plugs and Receptacles:

Dependent on local power codes

Machine Voltages	
84145	**115/60/1**
Service Current Requirement if Plug Connected	120/60/1
	15 Amp.
Terminal Designation of Plug	2 Pole 3 Wire Grdg.
NEMA Plug Configuration	5-15P
Plug Configuration	
Molded Plug on Cord	Yes
Plug – Straight/Angle	Straight
NEMA Receptable or Connector Configuration	5-15R
Power Cord Included	Yes



NOTE: Drawings show Model 84145-1 with optional attachment hub.

WARNING: Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or other codes in force.

*These dimensions pertain to machines with attachment hub.

If the machine is to be installed without legs the base must be sealed to the supporting surface for NSF approval.

As continued product improvement is a policy of Hobart, specifications are subject to change without notice.

CAD and/or Revit Files Available

Submittal Sheet

09/15/2026

ITEM# 2.52 - MIXER (1 EA REQ'D)

Hobart HL120-1STD

; Bench type mixer; with bowl, beater, & whip; US/EXP configuration - Mixer, Planetary, Bench, 12 quart capacity, (3) fixed speeds plus stir speed, gear-driven transmission, 15-Minute SmartTimer™, #12 taper attachment hub, manual bowl lift, stainless steel bowl, aluminum "B" beater, stainless steel "D" wire whip, stainless steel bowl guard, 1/2 hp, cord with plug

HOBART

Project _____

AIA # _____ SIS # _____

Item # _____ Quantity _____ C.S.I. Section 114000

11 40 01-300

FOOD PREPARATION

HL120 LEGACY+

12-Quart Maximum Heavy-Duty Mixer



SPECIFIER STATEMENT

Specified mixer will be an NSF rated 12-quart maximum heavy-duty, all-purpose mixer with Hobart PLUS System, three fixed speeds plus a stir speed. Mixer has ½ HP output at the planetary shaft and all-gear transmission. Features include automatic time recall, swing-out bowl, Shift-on-the-Fly™ controls and manual bowl lift. Mixer finished with a metallic gray hybrid powder coat and has a stainless steel bowl guard.

MODEL

❑ **HL120** 12-Quart Maximum Heavy-Duty Mixer

STANDARD FEATURES

Features in bold are exclusive to Hobart

+ **PLUS System**
  - **VFD*advantage* variable frequency drive**
  - **Maximum capacity overheat protection**
  - **Reinforced planetary shaft system**
+ **Triple interlock system with MagnaLock technology**
+ Heavy-duty ½ HP motor
+ Gear transmission
+ Three fixed speeds, plus stir speed
+ **Shift-on-the-Fly™ controls**
+ Soft start agitation technology
+ **15-minute SmartTimer™**
+ Automatic time recall
+ Large, easy-to-reach controls
+ **Single point bowl installation**
+ **Ergonomic swing-out bowl**
+ #12 taper attachment hub
+ Open base
+ Metallic gray hybrid powder coat finish
+ Stainless steel removable bowl guard

ACCESSORY PACKAGE

Featuring Hobart Quick Release™ Agitators

❑ HL120-1STD Standard Accessory Package includes:
  + 12-quart stainless steel bowl
  + 12-quart “B” beater
  + 12-quart “D” wire whip

HL120 LEGACY+ 12-QUART MAXIMUM HEAVY-DUTY MIXER

Approved by_____ Date_____ Approved by_____ Date_____

23141 SUNY Faye Corey Student Union

11 40 01-389

HL120 LEGACY+

12-Quart Maximum Heavy-Duty Mixer

SOLUTIONS/BENEFITS

PERFORMANCE

VFD*advantage* Variable Frequency Drive

- All-gear, direct drive system
- Ensures superior mixing consistency, motor protection and long life

Quick Release™ Agitators

- Eliminates the up/down play of bayonet-style agitators
- Consistent agitator-to-bowl ratio delivers superior mixing performance

Four Mixing Speeds

- Can handle virtually any mixing job
- Includes stir speed

Reinforced Planetary Shaft System

- Rugged durability under the most challenging mixing conditions

Maximum Capacity Overheat Protection

- Extreme-duty wiring and connections handle more power, reducing thermal cycling impact

EASE OF USE

Ergonomic Swing-Out Bowl

- Easily swing bowl to the side to remove/add ingredients
- Adds convenience and saves time

Single-Point Bowl Installation

- Easy-to-mount bowl uses only one point to install
- Reduces risk of spills, speeds up mixing process

Bowl Lift

- Ergonomic, smoothly moves bowl into mixing position

Shift-on-the-Fly™ Controls

- Allows safe, convenient speed changes while the motor is running
- Pulse and jog as needed

15-Minute SmartTimer™

- Automatic recall of time and speed

SANITATION & CLEANING

Stainless Steel Removable Bowl Guard

- Easy to remove without tools for cleaning
- Dishwasher-safe for easy cleaning and sanitizing

Soft Start Agitation Technology

- Gradually delivers electricity to the mixer
- Minimizes the risk of ingredient splash out

OPERATOR ASSURANCE

Triple Interlock System with MagnaLock Technology

- Prevents mixer from operating unless the bowl is fully up and locked in place and the bowl guard is secured

HL120 MIXER CAPACITY CHART

Recommended Maximum Capacities – dough capacities based on 70°F water and 12% flour moisture.

Product	Agitators Suitable for Operation	HL120
Capacity of Bowl (Qt. Liquid)		12
Egg Whites	D	1¼ pt.
Mashed Potatoes	B & C	10 lb.
Whipped Cream	D or C	2½ qt.
Cakes	B	12 lb.
Cookies, Sugar		10 lb.
Dough, Bread or Roll ★ (Lt.-Med.) 60% AR	ED	13 lb. ●
Dough, Heavy Bread 55% AR ★	ED	8 lb. ●
Dough, Thin Pizza 40% AR ★ (max. mix time 5 min.)	ED	5 lb. ●
Dough, Thick Pizza 60% AR ★	ED	11 lb. ●
Dough, Whole Wheat 70% AR	ED	11 lb. ●
Icing, Fondant	B	7 lb.
Icing, Marshmallow	C or I	1¼ lb.
Pasta, Basic Egg Noodle (max. mix time 5 min.)	—	—

Note: % AR (% Absorption Ratio) – Water weight divided by flour weight. Capacity depends on moisture content of dough. Above capacities based on 12% flour moisture at 70°F water temperature.

● 1st Speed

■ 2nd Speed

▲ 3rd Speed

★ If high gluten flour is used, reduce above dough batch size by 10%.

2nd speed should never be used on 50% AR or lower products.

Use of ice requires a 10% reduction in batch size.

1 gallon of water weighs 8.33 lbs.

Note: Attachment hub should not be used while mixing.

11 40 01-390

HL120 LEGACY+

12-Quart Maximum Heavy-Duty Mixer

SPECIFICATIONS

Motor: ½ HP high torque, 3-phase motor.

100-120/50/60/1 – 8.0 Amps
200-240/50/60/1 – 5.0 Amps

Electrical: 100-120/50/60/1, 200-240/50/60/1 – UL Listed.

Controls: Magnetic contactor and thermal overload protection. Internally sealed "Start-Stop" push buttons. A 15-minute SmartTimer™ is standard. SmartTimer™ includes:

- **Automatic Time Recall**, which remembers the last time set for each speed.
- **Transmission:** Gear-driven. Gears are constant mesh heat-treated hardened alloy steel along with anti-friction ball bearings. Grease lubricants furnished to all gears and shafts.

Speeds	Agitator (RPM)	Attachment (RPM)
Stir	59	33
First (Low)	107	61
Second (Intermediate)	198	113
Third (High)	365	207

Bowl Guard: Heavy-duty stainless steel wire front and solid rear portion. Front portion of guard rotates easily to add ingredients and install or remove agitator. It detaches in seconds for cleaning in dishwasher or sink. Rear portion of guard can be quickly cleaned in position. Guard must be in closed position before mixer will operate. Bowl support interlock provides further protection.

Bowl Lift: Ergonomic style, manual operated, self-locking in top and bottom position.

Finish: Metallic gray hybrid powder coat finish.

Attachment Hub: Comes with front-mounted Hobart standard #12 taper attachment hub for use with Hobart #12 size attachments.

Warranty: Unit has full one-year warranty on parts, labor and mileage against manufacturer's defects. Service contracts are available.

Attachments and Accessories:
The following are available at extra cost:

Attachment / Accessory	Device #
Stainless Steel Bowl	BOWL-HL12
"B" Flat Beater	BBEATER-HL12
"C" Wing Whip	CWHIP-HL12
"D" Wire Whip	DWHIP-HL12
"ED" Dough Hook	EDDOUGH-HL12
"P" Pastry Knife	PPASTRY-HL12
Mixer Table	TABLEHW-HL2012
Bowl Splash Cover (lexan)	SPLASH-LEX012
Bowl Scraper	SCRAPER-HL12
Ingredient Chute	CHUTE-HL12
9" Vegetable Slicer	VS9
Meat Chopper Attachment	12TIN-C/EPAN
Attachment Tray Support	TRAY-HL2012

Plugs and Receptacles:
Dependent on local power codes
X - Cord and Plus Standard
✓- Available at specified voltage, no plug and cord required

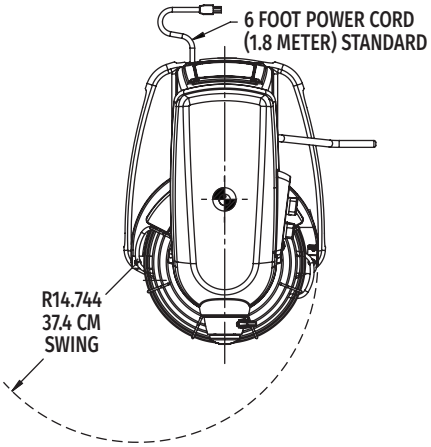
Machine Voltages		
HL120	**120/60/1**	**230/60/1**
Service Current Requirement if Plug Connected	120/60/1 15 Amp.	230/60/1 15 Amp.
Terminal Designation of Plug	2 Pole 3 Wire Grounding	2 Pole 3 Wire Grounding
NEMA Plug Configuration	5-15P	6-15P
Plug Configuration		
Molded Plug on Cord	Yes	Yes
Plug - Straight/Angle	Straight	Straight
NEMA Receptable or Connector Configuration	5-15R	6-15R
Power Cord Included	Yes	Yes

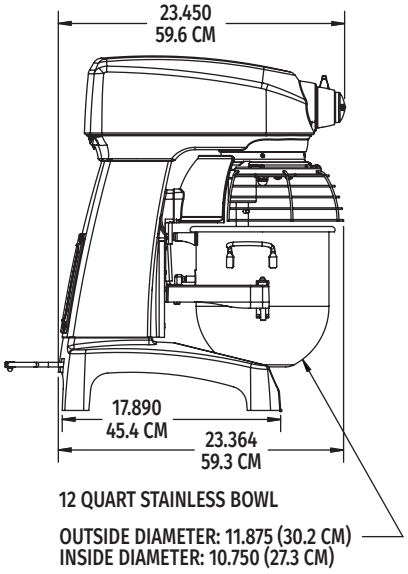
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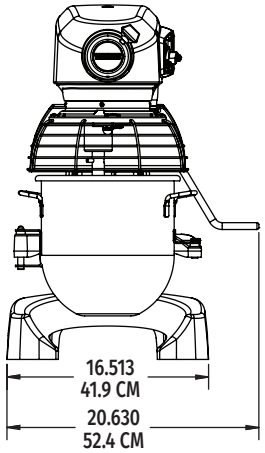
HL120 LEGACY+

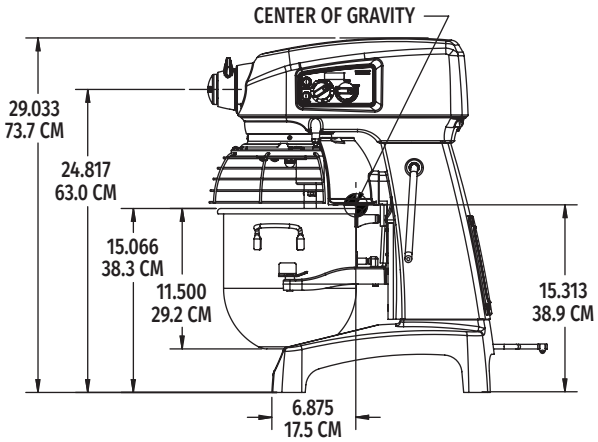
12-Quart Maximum Heavy-Duty Mixer

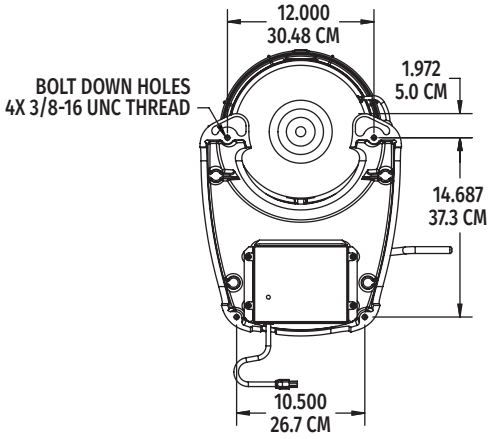
DETAILS AND DIMENSIONS











WARNING: **Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or other codes in force.**

NOTE:
Machine Weight (Less Bowl): 187 lbs. (84.8 kg)
Shipping Weight: 202 lbs. (91.6 kg)
Bowl Weight: 7.5 lbs. (3.4 kg)

As continued product improvement is a policy of Hobart, specifications are subject to change without notice.

CAD and/or Revit Files Available

11 40 01-392

Submittal Sheet

09/15/2026

ITEM# 2.53 - SLICER, ELECTRIC (1 EA REQ'D)

Hobart EDGE12-11

Centerline by Hobart Edge Series Slicer, manual, med duty, angle feed, 12" carbon steel knife, no volt release, poly-v belt drive, permanent ring guard, removable anodized aluminum carriage & knife cover, top mounted sharpener, anodized aluminum finish, 1/2 hp, cETLus, NSF (NET)

11 40 01-393

Project _____

AIA # _____ SIS # _____

Item # _____ Quantity _____ C.S.I. Section 114000

EDGE12
Slicer



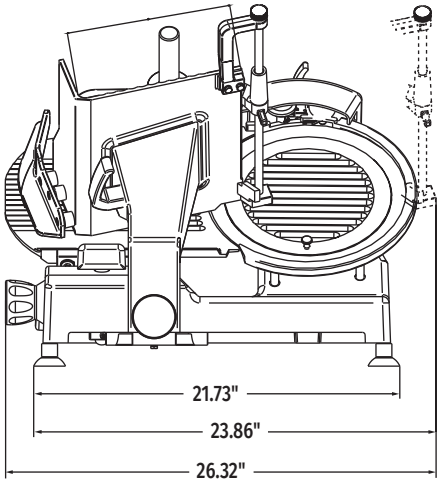
MODEL

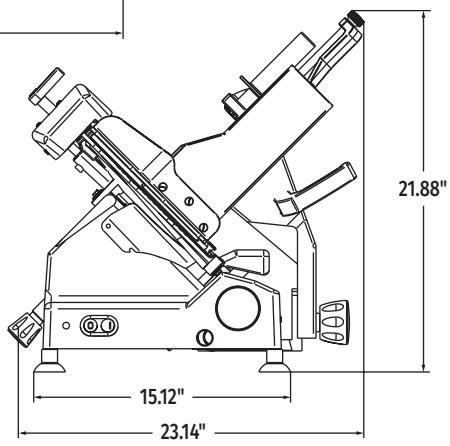
❑ **EDGE12** Manual slicer with 12" knife diameter – 120/60/1

STANDARD FEATURES

+ 1-speed, ½ HP knife drive motor
+ Poly-V belt drive system
+ 45° product table
+ Sanitary anodized aluminum base
+ Anodized aluminum carriage and knife cover
+ No-volt release
+ Removable carriage system
+ 12" diameter chrome-plated carbon steel knife
+ Removable top-mounted ceramic simultaneous sharpener
+ Permanent knife ring guard
+ Removable product deflector
+ Rear-mounted removable meat grip with contoured handle

DETAILS AND DIMENSIONS





SPECIFIER STATEMENT

Specified slicer will be an NSF rated medium duty manual EDGE slicer with a 12" diameter chrome-plated carbon steel knife and a Poly-V belt drive system. Slicer offers a removable carriage system, a top-mounted, removable ceramic stone sharpener and a permanently mounted ring guard. Features a ½ HP motor, 1 speed and no-volt release. Base is constructed from sanitary anodized aluminum to limit crevices and allow for easy clean up.

EDGE12 SLICER

Approved by _____ Date _____ Approved by _____ Date _____

23141 SUNY Faye Corey Student Union

11 40 01-394

EDGE12
Slicer

SOLUTIONS/BENEFITS

PERFORMANCE

½ HP Motor

12" Diameter Chrome-Plated Carbon Steel Knife

45° Product Table

+ Requires less mechanical pressure

Poly-V Belt Drive System

+ Design extends belt life while producing optimal slicing results
+ More economical for service and repairs with reduced parts and service time

EASE OF USE

Top-Mounted Ceramic Stone Sharpener

+ Single action sharpens and hones in 15 seconds
+ Removable and submersible for easy cleaning and sanitation
+ Two-stone, dual action system for a consistently sharp knife edge

Removable Meat Grip with Contoured Handle

+ Rear-mounted and removable

SANITATION & CLEANING

Removable Carriage System

+ Carriage has 11.5" manual travel

Sanitary Anodized Aluminum Base

Removable Product Deflector

+ Allows access for thorough cleaning
+ No tools required means easy removal

Anodized Aluminum Carriage and Knife Cover

+ Maxiumum sanitation and minimal clean up time

OPERATOR ASSURANCE

No-Volt Release

+ In the event of a power loss, slicer must be restarted before operation can continue

Permanently Mounted Ring Guard

+ Protects knife during operation and cleaning

Gauge-Plate Interlock

+ Gauge plate must be closed to remove carriage for cleaning and cannot be opened while carriage is removed

SPECIFICATIONS

Knife Motor: 1-speed, ½ HP motor. Totally enclosed, permanently lubricated ball bearings. Single phase capacitor-start, induction run.

Electrical: 120/60/1 – ETL listed, 4 amp.

Knife: Chrome-plated carbon steel knife; 12" diameter, hollow-ground, hardened, polished, forged and chromium-plated carbon steel knife. Anodized aluminum knife cover provides easy cleaning access. Gauge plate protects knife edge when index knob is turned to full clockwise position.

Cutting Capacity: Carriage handles food up to 10.0" wide by 6.0" high or 8.0" diameter.

Slice Thickness: Precision system provides infinite slice adjustment and consistent cuts of hard or soft foods from tissue to 9/16" or 14mm.

Finish: Anodized aluminum carriage, gauge plate, knife cover and base.

Start/Stop Button: Simple START/STOP button.

Cord and Plug: Attached 6-foot, flexible 3-wire cord and plug for grounded receptacle.

Warranty: All parts, service and travel coverage for one year excluding wear items.

Weight: Shipping – 85 lb.; Net – 68 lb.

Plugs and Receptacles:

Machine Voltages	
Service Current Requirement if Plug Connected	120/60/1
	15 Amp.
Terminal Designation of Plug	2 Pole 3 Wire Grounding
NEMA Plug Configuration	5-15P
Plug Configuration	
Molded Plug on Cord	Yes
Plug - Straight/Angle	Straight
NEMA Receptable or Connector Configuration	5-15R

As continued product improvement is a policy of Hobart, specifications are subject to change without notice.

CAD and/or Revit Files Available

11 40 01-395

Submittal Sheet

09/15/2026

ITEM# 2.54 - FOOD PROCESSOR (1 EA REQ'D)

Robot Coupe R402A

Combination Food Processor, 4.5 liter stainless steel bowl with handle, continuous feed kit with kidney shaped & cylindrical shaped hoppers, includes: (1) "S" blade (27344), (1) 2mm grating disc (27577), (1) 4mm slicing disc (27566), (1) 10mm dicing kit , on/off & pulse switch, two speeds, 600 & 1800 RPM, 2 HP, , cETLus, ETL-Sanitation

COMBINATION PROCESSOR : Bowl cutter & Vegetable prep

robot coupe

11 40 61 396

R 402

Dicing and French fries capability

3 BLADES

28 DISCS





A SALES FEATURES

R 402 Combination Processor: Bowl cutter & Vegetable Prep equipped with a cutter attachment for chopping, fine mincing, emulsions, grinding and kneading, and a vegetable preparation attachment for slicing, grating, ripple cut slicing, julienne, dicing and making French fries.

B TECHNICAL FEATURES

R 402 Combination Processor: Bowl cutter & Vegetable Prep. Single phase 120/60/1. Power 2 HP. Speeds: 600 & 1800 rpm. 4.5 L stainless steel cutter bowl and smooth bowl-base blade assembly. Vegetable preparation attachment with side ejection and stainless steel bowl. Lid equipped with 2 hoppers : 1 large and 1 cylindrical hopper. Supplied with 2 mm (5/64") grating and 4 mm (5/32") slicing discs. Large range of 28 stainless steel discs available as option. 20 to 100 meals.

Select your options at the back page, F part.

C TECHNICAL DATA

Output power	2 HP
Electrical data	120V/60/1 - 9 Amp
Speeds	600 & 1800 rpm
Dimensions (WxDxH)	9" x 12" x 22 1/2"
Rate of recyclability	95%
Net weight	39 lbs
Nema #	5-15P
Reference	R 402 Series A 120V/60/1

D

Number of meals per service	20 to 100
Quantity per batch in cutter function	Up to 5.5 lbs.
Vegetable slicer output	110 lbs.

E VEGETABLE PREPARATION FUNCTION

MOTOR BASE

- Induction motor for intensive use.
- Power 2HP
- Stainless steel motor shaft.
- Built in on / off / pulse buttons.
- Magnetic safety and motor brake.
- **Speeds**: 600 & 1800 rpm
- **Pulse** button for better cut precision.

CUTTER FUNCTION

- **4.5 L stainless steel cutter bowl** with handle, and high resistance smooth blade assembly.

VEGETABLE FUNCTION

- Vegetable preparation attachment equipped with 2 hoppers :
  1 large hopper (surface : 16 square inches) and 1 cylindrical hopper (Ø : 2 1/4").
- Removable chute and feed lead for dishwasher safe and easy cleaning.
- Side ejection for space saving and better user comfort to receive 5 7/8" high GN containers.
- Automatic restart of the machine by the pusher.
- Vertical pusher presses on vegetables for uniform cuts.
- Large range of 28 stainless steel discs available as option.

COULIS/ FRUIT SAUCE & CITRUS PRESS FUNCTIONS:

- **Option**: Juice Extractor Kit including a coulis/ fruit sauce attachment and a citrus press attachment to prepare amuse-bouche, in-a-glass preparations, sauces, soups, sorbets and ice cream, smoothies, jam, fruit pastes...

ACCESSORIES INCLUDED

- Cutter attachment: lid and high resistance stainless steel smooth blade assembly with removable cap.
- Vegetable attachment : chute, feed lead ejecting disc and discharge plate.
- Supplied with 2 mm (5/64") grating and 4 mm (5/32") slicing discs

STANDARDS
ETL electrical and sanitation Listed/ cETL (Canada)

ETL LISTED 9900098 Conforms to UL NSF/ANSI Std 763 Std 8 Certified to CAN/CSA Std C22.2 No.195

Robot Coupe USA, Inc.
264 South Perkins - Ridgeland, MS 39157
PH: 601-898-8411 - Toll free: 800-824-1646 - Fax: 601-898-9134
info@robotcoupeusa.com

23141 SUNY Faye Corey Student Union

COMBINATION PROCESSOR : Bowl cutter & Vegetable prep

11 40 61 397

R 402

F OPTIONAL ACCESSORIES

- **BLADE OPTIONS**
  - Coarse serrated blade assembly for kneading and grinding, ref 27346
  - Fine serrated blade assembly for chopping herbs and spices, ref 27345
- **OTHER OPTIONS**
- Juice Extractor Kit for fruit sauces and citrus fruit juice, ref 27396
- Wall-mounted blade and disc holder: holds 1 blade and 8 discs, ref 107810
- Dice cleaning kit, ref 39881

SUGGESTED PACKS OF DISCS

3 disc package	6mm (1/4") coarse grating, 6mm (1/4"x1/4") julienne and 1mm (1/32") slicing discs.
5 disc package	6mm (1/4") coarse grating, 6mm (1/4"x1/4") julienne and 1mm (1/32") slicing, 2 mm (5/64") julienne and 6 mm (1/4") slicing discs.

- **OPTIONAL DISCS**



SLICING	
1 mm (1/32")	27051
2 mm (5/64")	27555
3 mm (1/8")	27086
4 mm (5/32")	27566
5 mm (3/16")	27087
6 mm (1/4")	27786



RIPPLE CUTTING	
2 mm (5/64")	27621



GRATING	
1.5 mm (1/16")	27588
2 mm (5/64")	27577
3 mm (1/8")	27511
6 mm (1/4")	27046
9 mm (11/32")	27632
Hard Cheese grate	27764
Röstis potatoes	27191
Fine Pulping Disc	27078
Pulping Disc	27079
Pulping Disc	27130



JULIENNE	
2x4 mm (5/64" x 5/32")	27080
2x6 mm (5/64" x 1/4")	27081
2x2 mm (5/64" x 5/64")	27599
4x4 mm (5/32" x 5/32")	27047
6x6 mm (1/4" x 1/4")	27610
8x8 mm (5/16" x 5/16")	27048



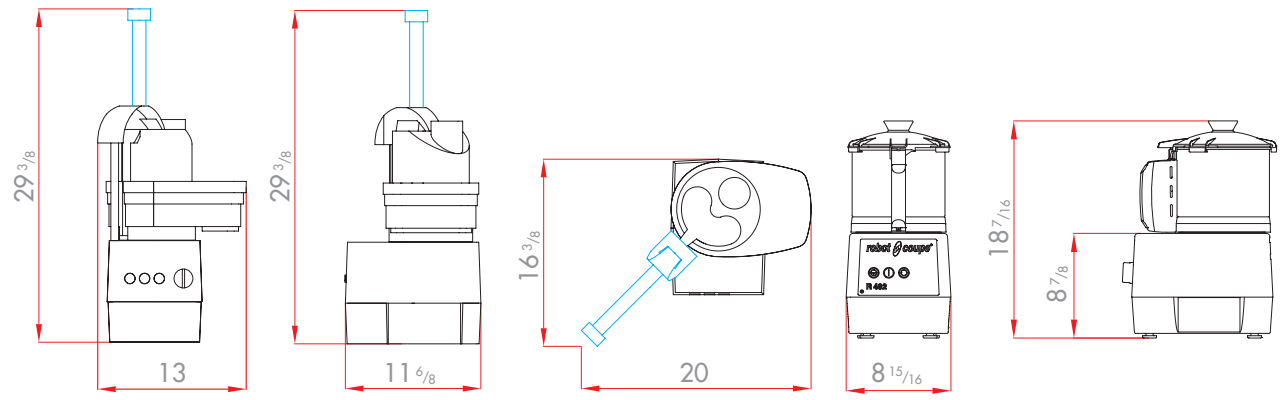
DICING EQUIPMENT	
8x8 mm (5/16")	27113
10x10 mm (3/8")	27114
12x12 mm (15/32")	27298



FRENCH FRY EQUIPMENT	
8x8 mm (5/16" x 5/16")	27116
10x10 mm (3/8"x 3/8")	27117

G ELECTRICAL DATA

120V/60/1 - delivered with cord and plug



23141 SUNY Faye Corey Student Union

11 40 01-398





R 401

R 402

	R 401	R 402
Induction motor	✓	✓
Power	1.5 HP	2 HP
Voltage	Single phase 120 V	Single phase 120 V
Speed	1725 rpm	600 rpm - 1800 rpm
Pulse	✓	✓
Motor support	Metal	Metal
Cutter	4.5 L stainless steel bowl	4.5 L stainless steel bowl
Blade	Stainless steel smooth "S" blade - **Included**	Stainless steel smooth "S" blade - **Included**
Vegetable slicer	Half-moon hopper Cylindrical hopper Ø 2 1/4"	Half-moon hopper Cylindrical hopper Ø 2 1/4"
Dicing & French fry capabilities	-	✓
Discs	Included: Slicing disc 4 mm (5/32"), grating disc 2 mm (5/64")	Included: Slicing disc 4 mm (5/32"), grating disc 2 mm (5/64")

Choose your model:

R 401	$
R401 - 120V/60/1	
2 discs	

R 402	$
R402A - 120V/60/1	
2 discs	

Scan the QR Code to see the food processor in action.

Complete disc collection page 42



Packs of discs available page 49

Select your pack of discs:



	Ref.	$
3 Disc Package	SP3Disc	
1 mm (3/64") Slicers · 6 mm (1/4") Grater · 6 mm (1/4") Julienne		
5 Disc Package	SP5Disc	
1 mm (3/64") · 6 mm (1/4") Slicers · 6 mm (1/4") Grater · 2 mm (5/64") · 6 mm (1/4") Julienne		

Choose your options:



Options	R 401 / R 402 Ref.	$
Coarse serrated "S" blade **Special Grinding - Pastry**	27346	
Fine serrated "S" blade **Special Herbs & Spices**	27345	
Additional Smooth "S" blade	27344	

BACK TO SUMMARY

23141 SUNY Faye Corey Student Union

11 40 01-399

Submittal Sheet

09/15/2026

ITEM# 2.55 - SCALE (1 EA REQ'D)

Hobart EPSA-1

Access Prepack Stand-alone scale, weighing capacity 50 lb. x .01 lb. (50.09 maximum) for all console models

11 40 01-400

Submittal Sheet

09/15/2026

ITEM# 2.56 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-401

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-402

Submittal Sheet

09/15/2026

ITEM# 2.57 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-403

Description: OPEN NUMBER

Notes: OPEN NUMBER

11 40 01-404

Submittal Sheet

09/15/2026

ITEM# 2.58 - BLAST CHILLER (1 EA REQ'D)

PrepRite PBF15.0

Blast Chiller/Freezer, reach-in, (15) 18" x 26" pan capacity, preloaded recipe catalog, customized programming, hinged door, chill (110 lbs) 194°F to 37°F/90 minutes & freeze (70 lbs) 194°F to 0°F/240 minutes, touch screen controller, self-contained refrigeration system, hot gas defrost, USB interface, HAACP compliant, stainless steel interior & exterior, casters, ETL, ETL-Sanitation

ACCESSORIES

Mfr	Qty	Model	Spec
PrepRite	1	5386	Single Point Non-Heated Probe, for use with all PrepRite Standalone Blast Chiller/Freezer Units except PBF4.0, included



PREPRITE™ BY EVERIDGE®

Project Name: 11 40 01-405

Location: _____

Item #: _____

© LPL 04/2021

PBF 15.0 Blast Chiller/Freezer

BLAST CHILLER/FREEZER SPECIFICATIONS
This unit fits perfectly into a professional kitchen workflow, making it possible to practice HACCP guidelines concerning the cook/chill concept. The unique ambient chill method and Indirect air circulation help to assure better food quality and safety.

Manufactured with the environment in mind, it includes advanced technology and important features to protect your long-term investment. Along with colder product temperatures, it offers lower utility costs, improved food safety and an excellent value in today's foodservice marketplace.

CAPACITY
15 pans 18" x 26" x 1" deep
Pans not included

DISTANCE between shelves 2.69"

OUTSIDE DIMENSIONS
32.25" (W) x 35" (D) x 78.25" (H)

INTERIOR DIMENSIONS
27.5" (W) X 19.5" (D) X 43" (H)

WEIGHT: 520 lbs

SHIPPING DIMENSIONS:
34" (W) X 38" (D) X 84" (H)

SHIPPING WEIGHT: 560 lbs

OUTPUT CHILLING CAPACITY
+194/+37°F 110 lbs within 90 minutes

OUTPUT FREEZING CAPACITY
+194/0°F 70 lbs within 240 minutes

OUTPUT THAWING CAPACITY
0°F/38°F 22 lbs within 240 minutes
0°F/38°F 44 lbs within 480 minutes
0°F/38°F 66 lbs within 720 minutes

HEAT LOAD BTU/HR: 16,578
- 10° F evaporator temperature/104° F ambient

ELECTRICAL SUPPLY:
208-240 V/1 PH/60 Hz (3 PH optional)

RLA/LRA/MOP: 12/102/33

40 A circuit, # 8 wire required

STANDARD FEATURES

- Ambient chill method
- Indirect air circulation to improve food quality
- HACCP compliant; self-contained refrigerated system
- Electronic touch screen control; user friendly and programmable for up to 99 recipes
- USB port; front mounted for easy access to download data, such as HACCP, or upload recipes
- Automatic hot gas defrost
- Rounded interior corners for simple cleaning
- Single point product probe
- Slide out refrigeration system for efficient service access
- Stainless steel rack system for pans or shelves
- Snap-in magnetic gasket for straightforward changes or cleaning
- Self-closing door, right-hand hinged
- Casters for effortless movement, front casters can be swivel, fixed or locked
- 304 Stainless steel interior and exterior front, sides, and top.
- Refrigerant: R404
- Environmentally friendly HFO insulation

WARRANTY

- Three year warranty on parts and labor
- Additional warranty for years 3-5 on compressor (parts only)

OPTIONAL ACCESSORIES

- Plastic coated shelves
- UV sanitizer
- Heated multi-point probe
- Three core probe kit
- Left-hand door
- Door bolt lock



Superior Quality
Made in Italy

Specifications subject to change without notice.

EVERIDGE®
Every step of the way®

CROWNTONKA® ICS® LOTEMP DOORS™
PREPRITE™ THERMALRITE®

Proud to be family-owned.

Submittal Sheet

09/15/2026

ITEM# 2.59 - WATER FILTER (1 EA REQ'D)

Everpure EV932401

Insurice® Water Filtration System, Insurice® Single-i2000², Single, (1) i2000² Micro-Pure® II Precoat primary filtration cartridge, reduces chlorine, taste & odor, inhibits scale, outlet pressure gauge, flushing valve, 9,000 gallons, 1.67 gpm, 0.5 micron, 3/8" inlet, 3/8" outlet, NSF 42 & 53 (EV932401)

EVERPURE® INSURICE® SINGLE - i2000² SYSTEM

DELIVERS PREMIUM QUALITY WATER FOR ICE APPLICATIONS

Insurice Single - i2000² System: EV9324-01
i2000² Replacement Cartridge: EV9612-22



APPLICATIONS

Ice Machines

- Cubers 500 lbs/day
- Flakers 1,500 lbs/day
- Capacity: 9,000 gals

FEATURES • BENEFITS

Reduces water-related ice machine problems caused by scale buildup from dirt and dissolved minerals

Sanitary cartridge replacement is simple, quick and clean. Internal filter parts are never exposed to handling or contamination

Reduces maintenance and service costs by reducing scale and clogging of distribution lines, evaporator plate and pump

Exclusive precoat filtration provides superior chlorine taste & odor reduction and micro-filters dirt and particles as small as 0.5 micron in size by mechanical means

Proprietary Micro-Pure® II filtration media effectively inhibits the growth of bacteria on the filter media that can decrease product life

Reduces chlorine taste & odor and other offensive contaminants

Self-contained scale inhibitor feed keeps ice machines functioning at full capacity

NSF/ANSI Standard 53 certified to reduce cysts such as *Cryptosporidium* and *Giardia* by mechanical means

INSTALLATION TIPS

Choose a mounting location suitable to support the full weight of the system when operating.

Never use saddle valve for connection.

Use 3/8" water line.

Do not connect system to water-cooled condenser.

Install vertically with cartridges hanging down and allow 2½" (6.35 cm) clearance below the cartridge for easy cartridge replacement.

Flush cartridges by running water through system for five (5) minutes at full flow.

OPERATION TIPS

Change cartridges on a regular six (6) month preventative maintenance program.

Change cartridges when capacity is reached or when flow becomes too slow.

Service flow rate must not exceed 1.67 gpm (6.3 Lpm).

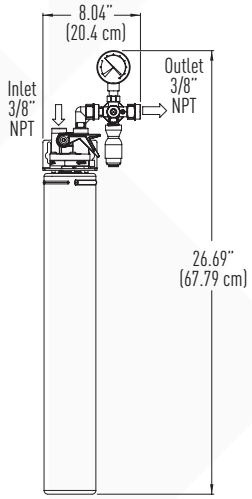
Always flush the filter cartridge at time of installation and cartridge change.

SIZING

Service Flow Rate: Maximum 1.67 gpm (6.3 Lpm)

EVERPURE® INSURICE® SINGLE - i2000² SYSTEM

EV9324-01



SPECIFICATIONS

Service Flow Rate
Maximum 1.67 gpm (6.3 Lpm)

Pressure Requirements
10 – 125 psi (0.7 – 8.6 bar), non-shock

Temperature
35 – 100°F (2 – 38°C)

Overall Dimensions
26.69" H x 8.04" W x 5.25" D
(67.79 cm x 20.4 cm x 13.3 cm)

Inlet Connection
3/8"

Outlet Connection
3/8"

Electrical Connection
None required

Shipping Weight
6 lbs (2.7 kgs)

Operating Weight
9 lbs (4 kgs)

System Tested and Certified by NSF International against NSF/ANSI Standards 42 and 53 for the reduction of:

STANDARD NO. 42 — AESTHETIC EFFECTS

- Chemical Reduction
  - Taste & Odor
  - Chlorine
- Mechanical Filtration
  - Nominal Particulate Class I

STANDARD NO. 53 – HEALTH EFFECTS

- Mechanical Filtration
  - Cyst

EPA No. 002623-IL-002

The contaminants or other substances removed or reduced by this drinking water system are not necessarily in your water. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system. Systems certified for cyst reduction may be used with disinfected water that may contain filterable cysts.

WARRANTY

Everpure water treatment systems by Pentair® (excluding replaceable elements) are covered by a limited warranty against defects in material and workmanship for a period of five years after date of purchase. Everpure replaceable elements (filter cartridges and water treatment cartridges) are covered by a limited warranty against defects in material and workmanship for a period of one year after date of purchase. See printed warranty for details. Pentair will provide a copy of the warranty upon request.

PENTAIR

WATER QUALITY SYSTEMS

EVERPURE-SHURFLO WORLD HEADQUARTERS, 1040 MUIRFIELD DRIVE, HANOVER PARK, IL 60133 USA • FOODSERVICE.PENTAIR.COM
800.942.1153 (US ONLY) • 630.307.3000 MAIN • 630.307.3030 FAX • CSEVERPURE@PENTAIR.COM EMAIL

EVERPURE-SHURFLO AUSTRALIA, 1-21 MONASH DRIVE, DANDENONG SOUTH, VIC 3175 AUSTRALIA
011.1300 576 190 TEL • 011.61.39.562.7237 FAX • AU.EVERPURE@PENTAIR.COM EMAIL

EVERPURE-SHURFLO CHINA, 21F CLOUD 9 PLAZA, NO 1118, SHANGHAI, 200052, CHINA
86.21.3211.4588 TEL • 86.21.3211.4580 FAX • CHINA.WATER@PENTAIR.COM EMAIL

EVERPURE-SHURFLO INDIA, GREEN BOULEVARD, B-9/A, 7TH FLOOR - TOWER B SECTOR 62, NOIDA - 201301
91.120.419.9444 TEL • 91.120.419.9400 FAX • INDIACUSTOMER@PENTAIR.COM EMAIL

EVERPURE-SHURFLO EUROPE, PENTAIR WATER BELGIUM BVBA, INDUSTRIEPARK WOLFSTEE, TOEKOMSTLAAN 30, B-2200 HERENTALS, BELGIUM
+32.(0).14.283.504 TEL • +32.(0).14.283.505 FAX • SALES@EVERPURE-EUROPE.COM EMAIL

EVERPURE-SHURFLO JAPAN INC., HASHIMOTO MN BLDG. 7F, 3-25-1 HASHIMOTO, MIDORI-KU, SAGAMIHARA-SHI KANAGAWA 252-0143, JAPAN
81.(0)42.775.3011 TEL • 81.(0)42.775.3015 FAX • INFO@EVERPURE.CO.JP EMAIL

EVERPURE-SHURFLO SOUTHEAST ASIA, 390 HAVELOCK ROAD, #04-01 KING'S CENTRE, SINGAPORE 169662
65.6768.5800 TEL • 65.6737.5149 FAX • CSEVERPURE@PENTAIR.COM EMAIL

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11 40 01-409

Submittal Sheet

09/15/2026

ITEM# 2.60 - ICE BIN (1 EA REQ'D)

Follett Products (Middleby) DEV1010SG-48-75

Ice-DevIce™ with SmartCART™ 75, 1000 lb. bin storage capacity, with front chute, poly liner, SmartGATE ice shield, poly door with PowerHinge™ door hinge, full stainless steel exterior and base, ABS/poly top custom cut for ice machine, includes 82 oz plastic ice scoop, paddle and rake set, and (1) polyethylene cart with hinged lid and (3) polyethylene Totes ice carriers, each carrier holds 25 lb/75 lb total per cart, for cube or Chewblet ice only, NSF

11 40 01-410

Single door Ice•DevIce™

ice storage, dispensing and transport systems



Shown with SmartCART™ 75, other configurations available

Gravity ice dispense eliminates scooping



Features

Designed with speed, safety and sanitation in mind
- elevated ice storage bin uses gravity to dispense ice through a chute seven times faster than scooping
- dispensing directly into cart eliminates scooping by hand to help prevent cross-contamination
- industry exclusive SmartGATE® ice shield controls the flow of ice to reduce spill and limit contact with ice
- locks in three positions and returns easily to full down position

Fresher ice
- first ice in is first ice out

Ice compatibility
- compatible with most non-flake ice types, including customer preferred Chewblet® ice and cube ice

Durable, user-friendly construction
- full stainless bin exterior and base
- corrosion-resistant poly bin liner and ABS top
- heavy duty "stay-open" PowerHinge™ door hinge – easy one hand open and close without door catches

SmartCART 75 ice cart fits through narrow aisles
- oversized back wheels for easy maneuverability
- holds 75 lb (34 kg) of ice in three Totes™ ice carriers

Easy installation
- comes with ice access door assembly attached to body of bin
- only 31.00" (78.7 cm) wide to fit through standard door openings by removing front door assembly (4 screws, no sealant)
- drain elbow with 1.00" (2.54 cm) barb fitting provided

Warranty
- parts and labor for corrosion repair for useful life of product
- 5 years parts and labor on all other integral components
- 3rd party ice machines must be installed and operated in accordance with the manufacturer's instructions
- visit follettice.com for complete warranty details

Includes:
- custom-cut non-corroding ABS top
- optional Flexi-Top™ ice bin top system for 48.00" (121.9 cm) and 60.00" (152.4 cm) wide models – allows many ice machines to fit one top
- SmartCART 75 ice transport cart with three removable Totes ice carriers (other configurations on reverse)
- 82 oz plastic ice scoop
- paddle and rake tool set with hanging bracket

Accessories

Additional carts and accessories (refer to form# 3435)

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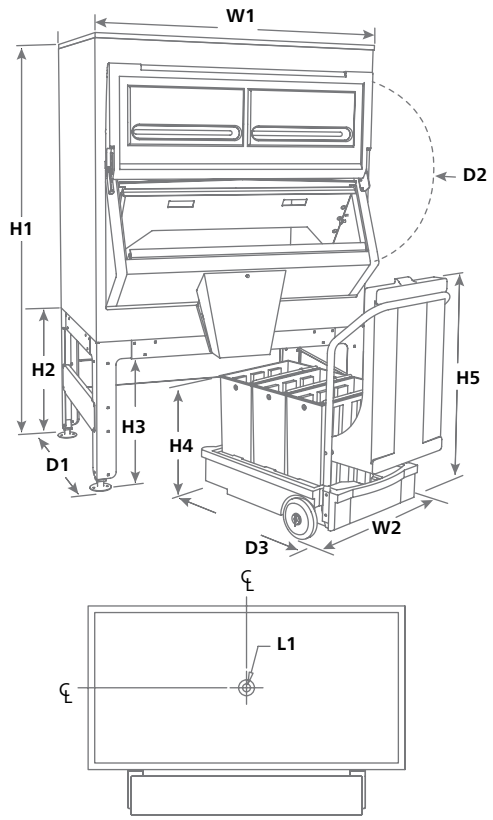
Specification

Maximum bin capacity[1]	see model table below
W1 Bin width	see model table below
D1 Bin depth	31.00" (78.7 cm)
Bin depth with lower door assembly[2]	39.00" (99.1 cm)
D2 Bin depth with door fully extended	49.50" (125.7 cm)
H1 Bin height[3] (adjustable)	see model table below
H2 Bin base height (adjustable)	24.75" (62.9 cm)
H3 Bin base clearance[4] (adjustable)	21.62" (54.9 cm)
Required door access[4]	32.00" (81.3 cm)
W2 Cart width	21.50" (54.6 cm)
D3 Cart depth	34.00" (86.4 cm)
H4 Cart height at front edge	20.50" (52.1 cm)
H5 Cart height with lid up	38.62" (98.1 cm)
L1 Drain[5]	1.00" FPT, center of bin bottom (drain elbow supplied)
Dispense rate	up to 5 lb (2.3 kg) per second
Ice compatibility	cube ice and Chewblet ice
Approximate ship weight	see model table below

NOTE: For indoor use only

SHORT FORM SPECIFICATION: Ice•DevIce system to be Follett model _____ elevated bin, base, and ice transport cart system with front ice chute and industry-exclusive SmartGATE ice shield. Bin to hold approximately _____ lb (kg) of ice. Exterior finish of bin and base to be full stainless front, sides, back and bottom. Bin liner to have non-corroding polyethylene walls and stainless steel bottom. Bin insulation to be CARB compliant non-HFC foam, bonded to shell and liner for added structural strength. Bin top to be ABS and custom-cut for ice machine(s) to be used. Lower door assembly to include non-corroding poly access door, poly lift door with PowerHinge to eliminate gasket and latches, and inner SmartGATE to positively control ice flow into access door area. Entire lower door assembly to be easily removable for installation through narrow doors. Upper inspection window (on all models except DEV500SG-30, DEV860SG-48 and DEV1080SG-30) to be double-wall poly to increase durability and minimize ice melt and condensation. Cart base to be rotomolded polyethylene with hinged plastic lid and drain. Totes to be of one-piece, molded poly with swivel handle. Cart and Totes to store below bin when not in use. All models to be equipped with flanged, adjustable feet, paddle and rake tool set. NSF listed.

Dimensional drawing



FLEXI-TOP, ICE•DEVICE, POWERHINGE, SMARTCART and TOTES are trademarks of Follett Products, LLC. CHEWBLET, FOLLETT and SMARTGATE are registered trademarks of Follett Products, LLC, registered in the US. Follett reserves the right to change specifications at any time without obligation. Certifications may vary depending on country of origin.

Model	with SC75 cart	with SC125 cart	with Cambro cart	with bagger kit[7]	Maximum bin capacity lb (kg)[1]	Cubic volume cu ft (m)	Width - **W1** in (cm)	Height[3] - **H1** in (cm)	Approximate ship weight lb (kg)
DEV500SG-30[6]	-75	-125	-ICS125L	-BG	460 (209)	14.80 (0.41)	30.00 (76.2)	63.00 (160.0)	361 (164)
DEV700SG-30	-75	-125	-ICS125L	-BG	680 (309)	21.70 (0.61)	30.00 (76.2)	78.50 (199.4)	396 (180)
DEV860SG-48[6]	-75	-125	-ICS125L	-BG	860 (391)	25.50 (0.72)	48.00 (121.9)	65.50 (166.4)	459 (208)
DEV1010SG-48	-75	-125	-ICS125L	-BG	1000 (454)	31.90 (0.90)	48.00 (121.9)	74.50 (189.2)	460 (209)
DEV1175SG-48	-75	-125	-ICS125L	-BG	1185 (538)	37.60 (1.06)	48.00 (121.9)	80.50 (204.5)	490 (222)
DEV1300SG-48	-75	-125	-ICS125L	-BG	1320 (599)	41.90 (1.19)	48.00 (121.9)	84.00 (213.4)	483 (219)
DEV1160SG-56	-75	-125	-ICS125L	-BG	1170 (531)	37.30 (1.06)	56.00 (142.2)	74.50 (189.2)	479 (217)
DEV1350SG-56	-75	-125	-ICS125L	-BG	1360 (617)	43.20 (1.22)	56.00 (142.2)	80.50 (204.5)	528 (239)
DEV1080SG-60[6]	-75	-125	-ICS125L	-BG	1080 (490)	34.30 (0.97)	60.00 (152.4)	65.50 (166.4)	497 (225)
DEV1325SG-60	-75	-125	-ICS125L	-BG	1325 (602)	42.00 (1.19)	60.00 (152.4)	74.50 (189.2)	525 (238)
DEV1475SG-60	-75	-125	-ICS125L	-BG	1490 (676)	47.40 (1.34)	60.00 (152.4)	80.50 (204.5)	525 (238)
DEV1650SG-60	-75	-125	-ICS125L	-BG	1660 (754)	52.80 (1.50)	60.00 (152.4)	84.00 (213.4)	539 (244)

1 Computed on cubic volume of bin. Does not reflect cart capacity or voids that can occur due to pyramiding.
2 Lower door assembly easily removed for installation access.
3 Special top required for ice machines weighing more than 1000 lb (454 kg). Add 0.5" (1.27 cm) to height. Contact factory.
Note: Not available for model DEV500 and DEV700.
4 Required clearance for installation access through doors (may require removal of lower door assembly).
5 Follett recommends installation of a floor drain with grate with all ice storage bins. Consider cart positioning when locating the drain. Clearance required to pull cart from below bin — minimum 36.00" (91.4 cm), optimal 40.00" (101.6 cm).
6 DEV500SG-30, DEV860SG-48 and DEV1080SG-60 do not have upper inspection window.
7 Bagger kit includes 250 plastic bags of 10 lb (4.5 kg) capacity.

Single door Ice•DevIce

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Submittal Sheet

09/15/2026

ITEM# 2.61 - ICE MACHINE, CUBE (1 EA REQ'D)

Follett Products (Middleby) HCD710ABT

Horizon Elite™ Chewblet® ice machine, air-cooled, self-contained condenser, for mounting on Follett ice storage bins, up to 759 lb production of Chewblet® ice in 24 hours, NSF, ETL

ACCESSORIES

Mfr	Qty	Model	Spec
Follett Products (Middleby)	1	MDD-1003	Remote monitoring with Open Kitchen™, three-year subscription and hardware for first piece of equipment (NET)

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Horizon Elite™

self-contained 710 series Chewblet® ice machine



Features

Horizon Elite

- ☐ 710 series - up to 759 lb (345 kg) in 24 hours
- automatically transport ice through a tube with RIDE® technology from up to 75' (22.9 m) away
- chewable, compressed nugget ice is preferred over cubes[1]
- ice dispenses reliably from ice and beverage dispensers
- available with approximately 1.00" (2.54 cm) long standard Chewblet ice or optional 3/8" (0.95 cm) long Micro Chewblet™ ice
- quiet production without noisy harvest cycles

Revolutionary, scale inhibiting design

- produces ice that has 15% the TDS of the incoming water for optimum dispensing and long life in drinks
- quarantines and regularly expels scale producing dissolved solids to dramatically reduce scale buildup
- increases time between descaling and reduces or eliminates the need for expensive scale treatment
- saves 35% water compared to comparable cubers
- HCD and HMD models ENERGY STAR® certified

Durable, attractive ice machine

- regular bearing inspection or replacement is not required
- upgraded, easy-to-read LED operating status and diagnostic display

Designed with sanitation in mind

- Agion® silver-based antimicrobial product protection of key ice and water contact components[2]
- floatless, sealed design inhibits formation of biofilms
- semi-automatic cleaning and sanitizing system

Remote monitoring with Open Kitchen™

- provided in partnership with Powerhouse Dynamics (separate subscription required)
- real-time alerts and notifications
- remote diagnostics to maximize equipment uptime
- connects with equipment across other Middleby brands

Warranty

- 3 years parts and labor, 5 years compressor parts[3]

Certifications

"E" models only

Short form specification:

Ice machine to be a Follett® Horizon Elite ice machine model _____ [Insert size/series, condenser type and installation/ mounting, from model number guide] capable of producing compressed nugget ice using an efficient, sanitary horizontal evaporator/auger system and delivering ice by a flexible wire reinforced transport tube to ☐ ice storage bin, ☐ ice and water dispenser, ☐ ice and beverage dispenser or ☐ drop-in dispenser and provided with a stainless steel frame and exterior, slide-out compressor/condenser with utility docking station, front-mounted unit status display, evaporator water inlet at harvest end with automatic flush while producing ice, and semi-automatic cleaning and sanitizing system, plus all the features listed below and mounting/performance-enhancing accessories checked.

Model configurations

For use with[1]	Install/mount	Condenser	V/Hz/Ph	Item number[2]
ice storage bin	**top mount**	air	115/60/1	**HCD710ABT**
			230/50/1	**HCE710ABT**
	RIDE	air	115/60/1	**HCD710ABS**
			230/50/1	**HCE710ABS**
Follett Vision™ undercounter ice and beverage dispenser	**RIDE**	air	115/60/1	**HCD710AVS**
			230/50/1	**HCE710AVS**
countertop ice and beverage dispenser (by others)	**top mount[3]**	air	115/60/1	**HCD710AHT**
			230/50/1	**HCE710AHT**
	RIDE	air	115/60/1	**HCD710AHS**
			230/50/1	**HCE710AHS**
drop-in dispenser (by others)	**RIDE**	air	115/60/1	**HCD710AJS**
			230/50/1	**HCE710AJS**

[1] Ordered separately.
[2] For Micro Chewblet ice, replace second character (C) with an M e.g. HMD710ABT.
[3] Requires top kit (see page 4).

[1] Independent third party studies. Contact Follett for details.
[2] Disclaimer: Antimicrobial protection is limited to the treated components and does not treat water or ice.
[3] Refer to price list for additional warranty information.

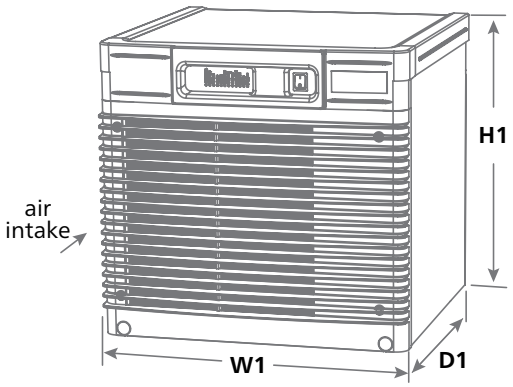
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Accessories

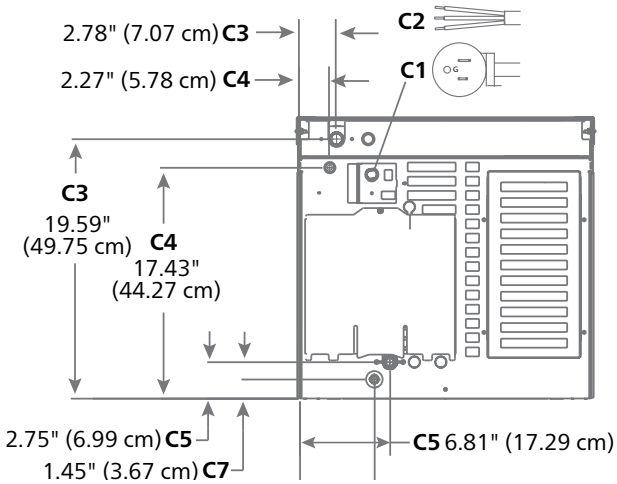
- ☐ Top kit for ice and beverage dispensers (page 4)
- ☐ Water filters (refer to form# 9905)
- ☐ Wall mount bracket (item# 00997098)
- ☐ Ice machine stand, height-adjustable (item# 00997080)
- ☐ Timer to control one or two ice machines (item# 00967265)
- ☐ Longer ice transport tube (refer to price list, form# 4025)
  NOTE: 10' (3 m) provided as standard for RIDE model.
- ☐ Sleep cycle kit for improved energy efficiency and component life (item# 01338276)
  NOTE: For countertop dispenser applications for models ending in HS and HT.
- ☐ SafeCLEAN Plus™ ice machine cleaner
  - ☐ 1 x 8 oz (237 ml) bottle (item# 01147826)
  - ☐ 6 x 8 oz (237 ml) bottles (item# 01149954)
  - ☐ 24 x 8 oz (237 ml) bottles (item# 01149962)
- ☐ SaniSponge™, 24 sanitary sponges (item# 01075431)
- ☐ Three year remote monitoring subscription for Open Kitchen
  NOTE: For serial number Q34181 and above.
  - ☐ For first piece of equipment at location (item# MDD-1003)
  - ☐ For subsequent pieces of equipment at location (item# MDD-1004)
- ☐ For additional accessories, refer to form# 4025

Dimensional drawing



Specification

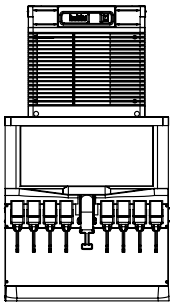
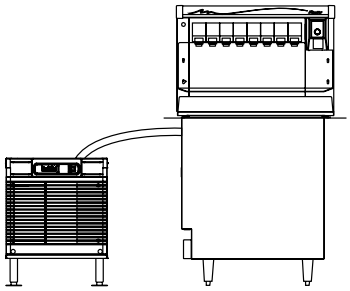
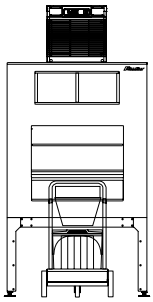
W1 Width	22.70" (57.7 cm) Fits on 22.00" wide dispensers
D1 Depth	24.50" (62.2 cm)
H1 Height	21.25" (54.0 cm)
Clearance	top mount – 1.00" (2.54 cm) RIDE – See page 5-6 for details
C1 Electrical 115 V/60/1 – HCD and HMD models	11.3 amps, requires dedicated 15 amp circuit, 6' (1.8 m) cord, NEMA 5-15 plug
C2 Electrical 230 V/50/1 – HCE and HME models	6.0 amps, requires dedicated 15 amp circuit, 6.5' (2 m) cord only.
Operating power	0.7 kW
C3 Ice transport tube	see page 8 for details
C4 Water inlet	3/8" OD push-in water inlet
C5 Drain	3/4" MPT, 1" drain required see page 7 for details
C6 Ice bin signal cord	for Vision applications only
C7 Auxiliary drain (required)	3/8" OD push-in
Air temperature	50 -100 F (10 - 38 C)
Water temperature	45 - 90 F (7 - 32 C)
Potable water pressure	10 - 70 psi (69 - 483 kPa)
Ice production	see ice production chart on page 8
Energy consumption 90 F (32 C) air, 70 F (21 C) water	4.78 kWh per 100 lb (45.4 kg) ice
Heat rejection	8,500 BTU/hr (2,143 Kcal/hr)
Water consumption	12.0 gal (45 L) of potable water per 100 lb (45.4 kg) of ice (per AHRI test standards). 12.4 gal (46.9 L) at low TDS flush setting.
Refrigerant	R404A – HCD and HMD models R449A – HCE and HME models
Approximate ship weight	190 lb (86 kg)
Approximate net weight	152 lb (96 kg)
NOTE: For indoor use only	

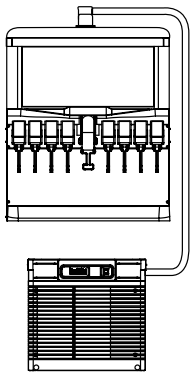
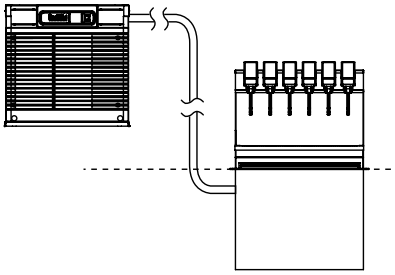
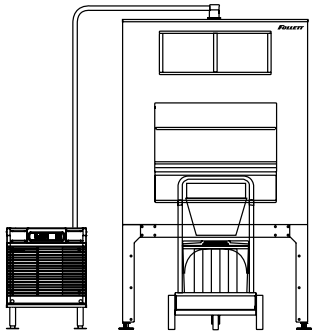


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1 – Locating the ice machine

Horizon Elite self-contained Chewblet ice machines allow top-mounting or mounting in a base cabinet, on a wall or on a floor stand up to 75' (22.9 m) from the dispenser or ice bin with RIDE technology. In-cabinet mounting (RIDE applications) require special attention to service access, unit ventilation and ice tube runs (see pages 4-8).

Top mounting – ice and beverage dispensers (by others)	**RIDE model – Follett low-profile Vision ice and beverage dispensers**	**Top mount on Follett ice storage bins**
		
Important specifier notes	**Important specifier notes**	**Important specifier notes**
1. Dispenser must be compatible with nugget ice. See page 4 for compatible ice and beverage dispenser models and top kit numbers. 2. Verify ceiling or soffit height to ensure sufficient top clearance.	1. See pages 4-6 for critical clearance and venting requirements. 2. Ice transport tube ships with Vision ice and beverage dispenser (Vision applications only).	1. See form# 8590 for bin sizing. 2. Verify ceiling or soffit height to ensure top clearance. 3. Locate floor sink or grate and drains in front of storage bin. 4. Do not position bin drain lines to block Ice•Devlce™ bin cart.

RIDE model – ice and beverage dispensers (by others)	**RIDE model – drop-in beverage dispensers (by others)**	**RIDE model – Follett ice storage bins**
		
Important specifier notes	**Important specifier notes**	**Important specifier notes**
1. Dispenser must be compatible with nugget ice. Compatible dispensers include Servend MD150/175/200/250, SV175/200/250, MDH-402, and Follett Symphony Plus™ 110CM as well as the dispensers listed on page 4. 2. Coca-Cola Freestyle 7100 requires top adapter IC Code 46751 and ice kit IC Code 46430 and must be ordered from Coca-Cola. Coca-Cola Freestyle 9100 requires top kit HSF26SC. Consult with Coca-Cola and Follett to qualify application prior to ordering. 3. RIDE application is approved only for Pepsi Spire 3.0, 5.0 and 4.1 designed for top mount ice machines and requires MSP24SC for 3.0 and MSP30SC for 5.0 and 4.1, ordered separately. For manual fill versions of Pepsi Spire 3.0, 5.0 and 4.1, contact factory. 4. See pages 4-6 for critical clearance and venting requirements.	1. Compatible with the following dispensers: Cornelius 1522, 1722, 2323 and Lancer 2200, 2300, 23300. 2. Requires 12.00" (30.5 cm) of access space for installation on transport tube side. 3. See page 5-6 for critical clearance requirements.	1. See form# 8590 for bin sizing. 2. Locate floor sink or grate and drains in front of storage bin. 3. Do not position bin drain lines to block Ice•Devlce bin cart.

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1 – Locating the ice machine (continued)

Top mounting – compatible ice and beverage dispensers[1]

Manufacturer	Model number	Width in (cm)	Depth [2] in (cm)	Height [3] in (cm)	Top kit
Coca-Cola dispensers	Freestyle 7000	30.10 (76.5)	33.11 (79.0)	47.00 (119.4)	H22F30-F [4]
	Freestyle 7100	30.00 (76.2)	33.80 (85.8)	47.00 (119.4)	H22F30-F [4, 5]
	Freestyle 9000	25.50 (64.8)	35.50 (90.2)	73.75 (187.3)	H22F24-F [4, 6]
	Freestyle 9100	25.50 (64.8)	39.25 (99.7)	77.25 (196.2)	H22F26-F [4]
Cornelius dispensers	DB/ED/DF 150 series	22.00 (55.9)	30.75 (78.1)	35.63 (90.5)	H22C22-F
	DB/ED/DF 175 series	24.50 (62.2)	30.00 (76.2)	35.63 (90.5)	H22C24-F
	DB/ED/DF 200 series	30.00 (76.2)	30.95 (78.6)	35.63 (90.5)	H22C30-F or H22C30-X [7]
	DB/ED/DF 250 series	30.00 (76.2)	30.95 (78.6)	39.63 (100.7)	H22C30-F or H22C30-X [7]
	DB/ED/DF 300 series	44.38 (112.7)	30.00 (76.2)	39.63 (100.7)	H22C44-F or B [8]
	FlavorFusion / Overload	30.00 (76.2)	33.13 (84.2)	41.00 (104.1)	H22C30-F-FF
	IDC215	30.00 (76.2)	33.13 (84.2)	36.69 (93.2)	H22C30-F-IDC
	IDC255 and Pro Fast Gate	30.00 (76.2)	33.13 (84.2)	39.75 (101.0)	H22C30-F-IDC
	IDC Pro	30.00 (76.2)	33.13 (84.2)	40.25 (102.2)	H22C30-X-PRO [8]
Lancer dispensers	4500-22N	22.00 (55.9)	30.50 (77.5)	36.66 (93.1)	H22L22-F
	4500-30N	30.00 (76.2)	30.50 (77.5)	36.66 (93.1)	H22L30-F
	FS-22N	22.00 (55.9)	30.50 (77.5)	41.28 (104.8)	H22L22-F
	FS-30N	30.00 (76.2)	30.50 (77.5)	41.28 (104.8)	H22L30-F
	Bevariety	30.00 (76.2)	31.00 (78.7)	37.75 (95.9)	H22L30-F-STP
	Sensation 30"	30.00 (76.2)	31.00 (78.7)	38.25 (97.2)	H22L30-F-STP
	Sensation 44"	44.00 (111.8)	31.00 (78.7)	39.38 (100.0)	H22L44-F-STP
	Touchpoint	32.50 (82.6)	33.70 (85.6)	40.00 (101.6)	H22L30-F-STP
Pepsi dispensers	Spire 3.0	27.00 (68.6)	35.00 (88.9)	38.12 (96.8)	H22P24-F
	Spire 5.0 / 4.1	30.50 (77.5)	36.00 (91.4)	42.75 (108.6)	H22P30-F
Servend dispensers	MDH-302	42.75 (108.6)	30.50 (77.5)	35.16 (89.3)	H22S44-F or B [9]

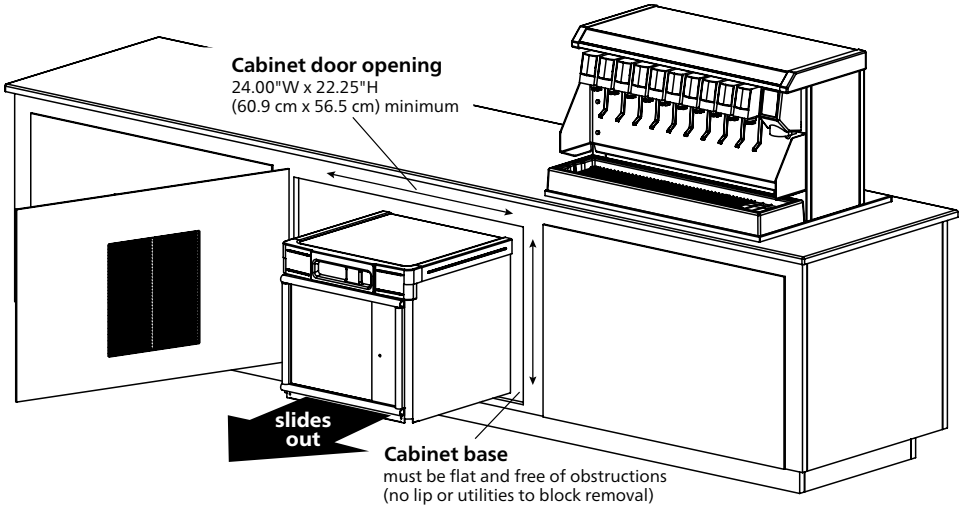
[1] All approved dispensers can be filled with a RIDE model Horizon Elite ice machine without a top kit except Pepsi Spire 3.0, 5.0 and 4.1, see page 3 for details.
[2] Requires minimum 1.00" (2.54 cm) clearance between back of dispenser and wall.
[3] Net height after installation of top kit (excluding height of ice machine).
[4] Consult with Coca-Cola and Follett to qualify application prior to ordering.
[5] Top adapter IC Code 46753 and ice kit IC Code 46430 must also be ordered from Coca-Cola.
[6] Adapter must also be ordered from Coca-Cola. IC Code: 46010 (Silver), 46011 (Red) or 46012 (Black).
[7] Top designed with flexibility to accommodate front or back mounting.
[8] Top designed with flexibility to accommodate front or back mounting.
[9] Specify "F" for front facing, or "B" for backward facing units.

2 – Undercounter/in-cabinet mounting

Cabinet details

Important specifier notes

1. Cabinet door opening must meet minimum size requirements shown and be free of obstructions to allow ice machine to slide out (no lip or utilities to block removal).
2. Cabinet base must be capable of supporting ice machine and allow ice machine to rest flat on cabinet bottom.
3. No counter supports, electric or plumbing can run in front of the ice machine.

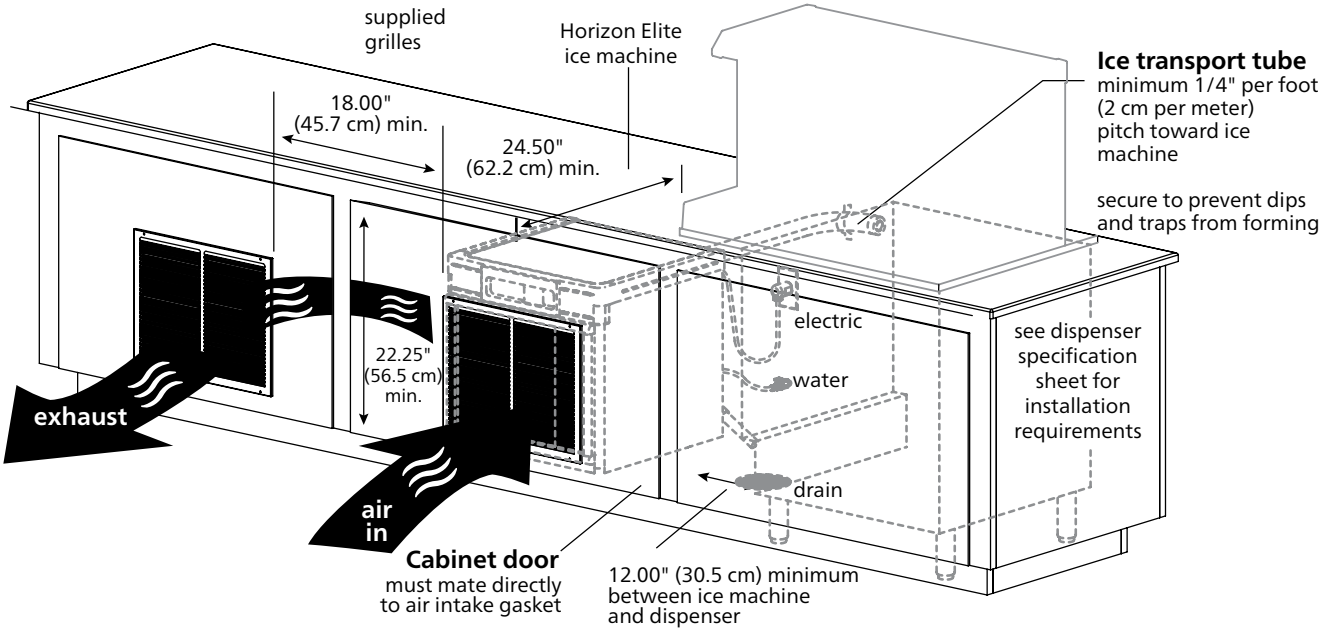


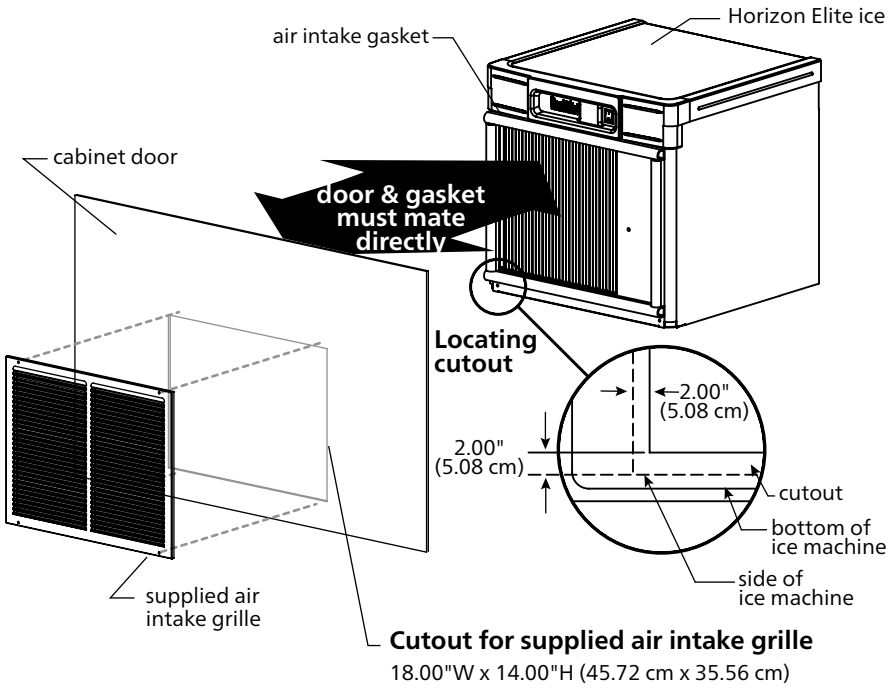
11 40 01-417

3 – Undercounter/in-cabinet mounting and ventilation

Using Follett supplied grilles

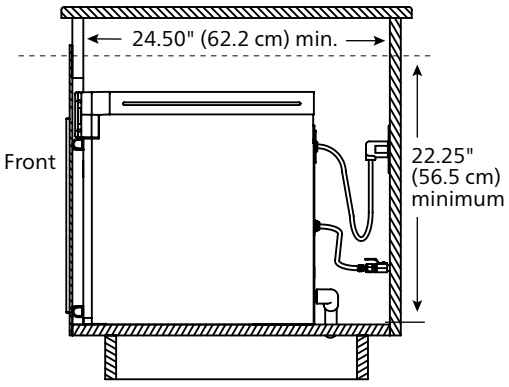
Horizon Elite ice machines can be installed undercounter/in-cabinet to fill bins or dispensers using RIDE technology. Care must be taken to ensure proper cabinet venting to avoid recirculation of hot air. Improper venting can cause ice machine outages.





Completed installation with gasket and door in place –

side view



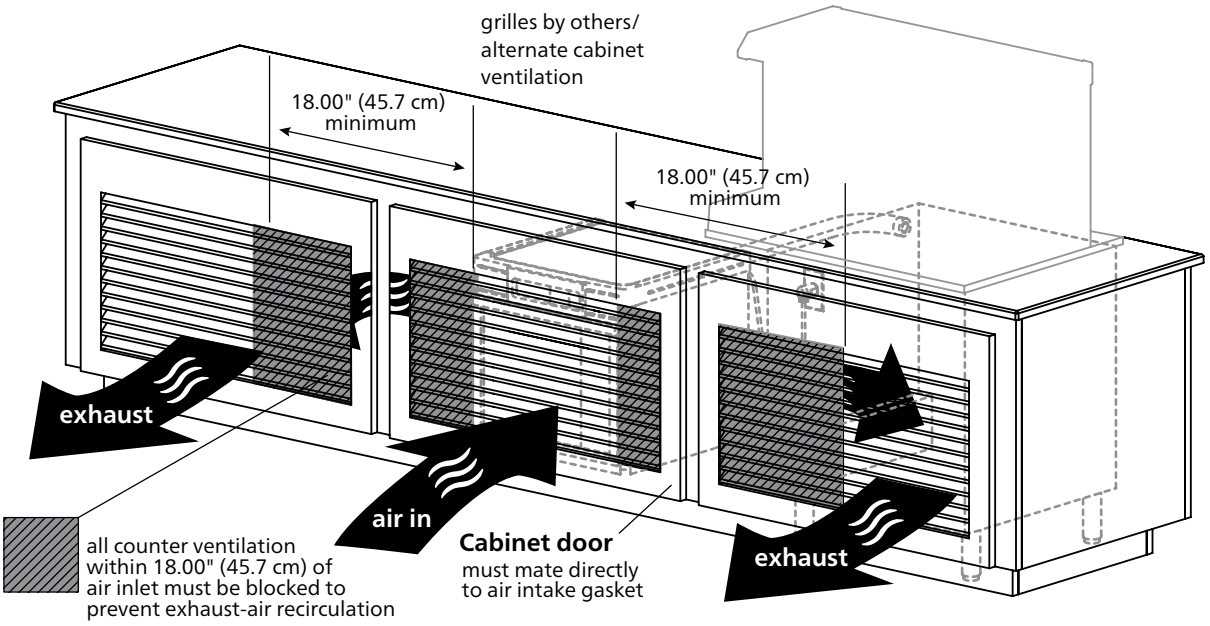
Important specifier notes for using Follett supplied grilles

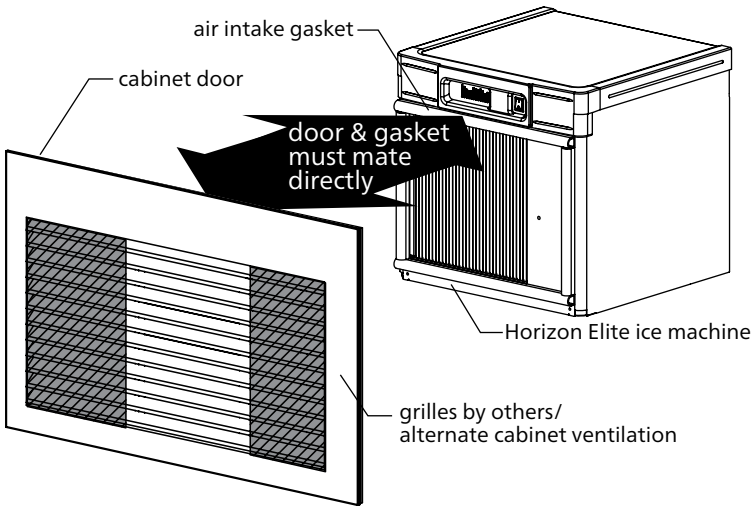
1. The supplied exhaust grille must be located at least 18.00" (45.7 cm) from the supplied air intake grille (exhaust air must not recirculate with intake air).
2. Cabinet interior must be open to allow for unrestricted exhaust air flow.
3. Ice transport tube needs minimum 1/4" per foot (2 cm per meter) pitch toward ice machine and should be secured to prevent dips and traps from forming.
4. Cabinet door must mate directly to air intake gasket.
5. Cabinet interior must provide a minimum clear space of 24.50" (62.2 cm) deep by 22.25" (56.5 cm) high.
6. Cutout for supplied grilles must meet minimum size requirements shown above.
7. Utilities should be conveniently located as shown.

3 – Undercounter/in-cabinet mounting and ventilation (continued)

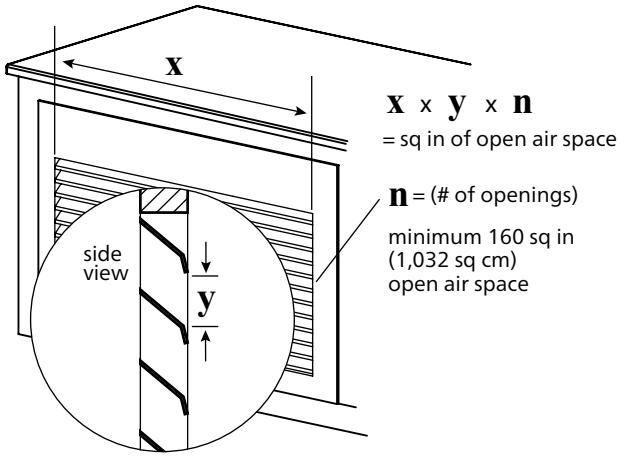
Using grilles by others/alternate cabinet ventilation

Cabinets with ventilation or louvers other than those provided require special consideration to provide proper ventilation. Recirculation of hot air will reduce ice machine performance and can cause ice machine outages.





Minimum open air space

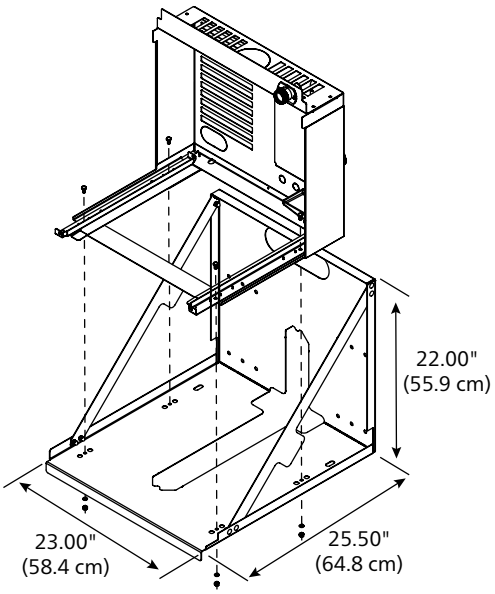
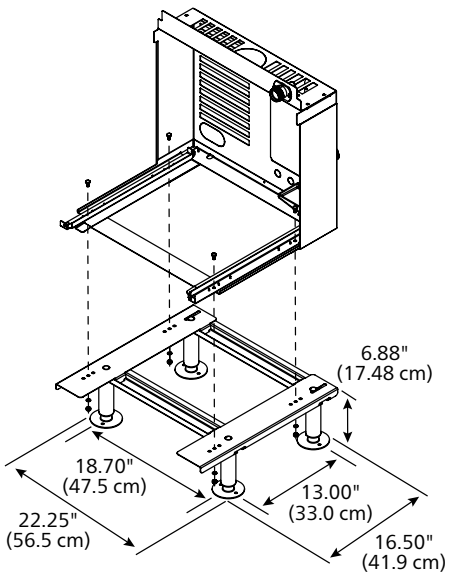


Important specifier notes for using grilles supplied by others/alternate cabinet ventilation

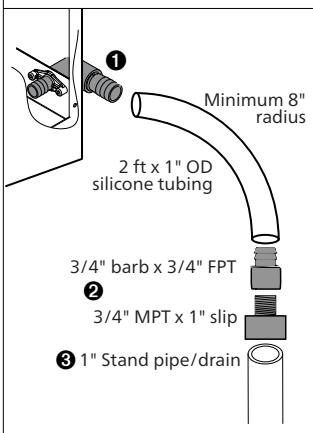
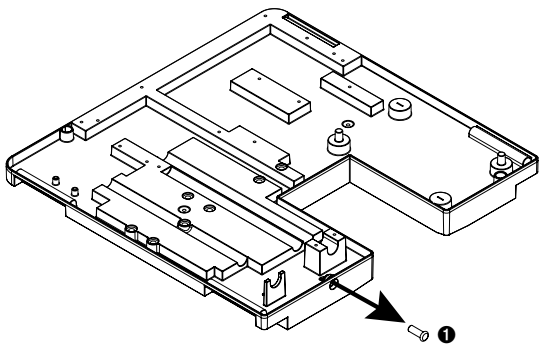
1. Exhaust must be at least 18.00" (45.7 cm) from air intake (exhaust air must not recirculate with intake air).
2. Cabinet interior must be open to allow for unrestricted exhaust air flow.
3. Ice transport tube needs minimum 1/4" per foot (2 cm per meter) pitch toward ice machine and should be secured to prevent dips and traps from forming.
4. Ducting must be provided if cabinet door does not mate directly to air intake gasket.
5. Cabinet interior must provide a minimum clear space of 24.50" (62.2 cm) deep by 22.25" (56.5 cm) high.
6. Grilles by others must meet minimum requirements for open air space shown above.
7. Utilities should be conveniently located as shown.

11 40 01-419

4 – Horizon Elite ice machine mounting accessories

Optional wall mount bracket	Optional machine stand	Important specifier notes
		1. For secure wall mounting, specify optional wall mount bracket. 2. Wall and fasteners must support the weight of the ice machine, bracket, supply water and ice. Use of a backing board may be required with hollow wall construction. 3. Machine stand mounting adds 6.88" (17.5 cm) to height of ice machine. 4. No dips in tube routing allowed. 5. Ice transport tube needs minimum 1/4" per foot (2 cm per meter) pitch toward ice machine and should be secured to prevent dips and traps from forming.

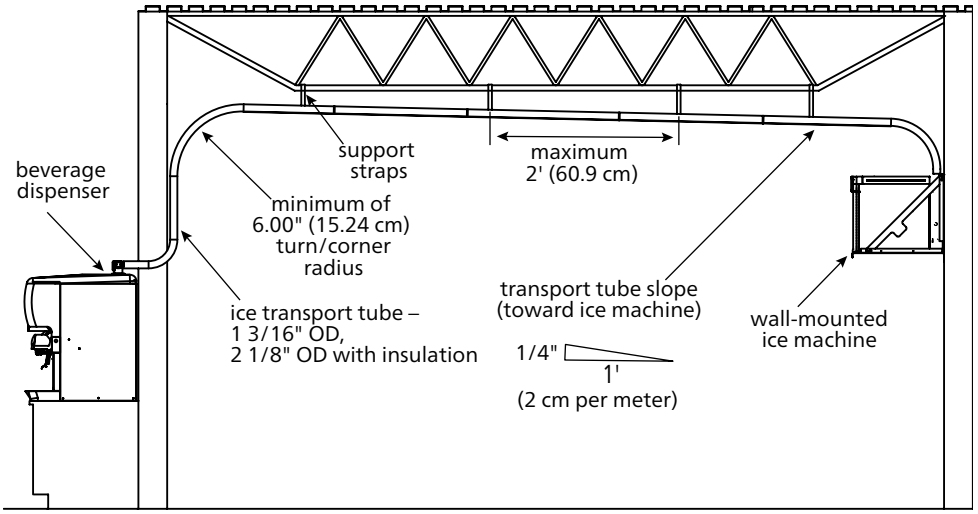
5 – Horizon Elite drains - specifier guidelines

Ice machine drain plumbing	Important specifier notes: Where code allows, follow recommendation below.
	1. Apply Teflon tape to 3/4" male outlet ice machine fitting. Thread on either the provided straight 3/4" barb adapter or a 90 degree adaptor. Connect the supplied 2' (0.61 m) silicone hose to the 3/4" drain barb ❶. 2. It is recommended that the silicone hose be routed down into a 1.5" or 2" standpipe/drain. The minimum drain size for the ice machine is 1". Note: 3/4" to 1" PVC adapter fittings are provided if a larger drain size is not possible ❷ ❸. Note: Minimum 8" radius on silicone drain line. Drain line from the ice machine must have at least 1/4" per foot pitch (6.4 mm/0.3 m). Note: Standpipe/drain provided by others. All other components provided with ice machine.
Chassis drain plumbing – Required	**Important specifier notes: Where code allows, follow recommendation below.**
	1. Remove white 3/8" plug from rear push-in fitting ❶. 2. Route 3/8" OD drain tubing (preferably copper) through rear of docking station and fully insert into chassis base push-in fitting. Route into drain standpipe. 3. Gravity drain. Ensure 3/8" OD tubing slopes down into drain standpipe without forming a trap.

11 40 01-420

6 – Horizon Elite ice tube runs - specifier guidelines

Long tube runs for RIDE remote ice delivery equipment



Important specifier notes

1. 75' (22.9 m) maximum ice transport tube run.
2. Tubing routing bends must have a 6.00" (15.24 cm) radius or larger.
3. Dips and traps are not allowed. A 3" (7.62 cm) or larger PVC pipe chase is suggested to support the tubing run. If not supported, secure insulated ice transport tube at least every 2′ (0.61 m) to prevent drips and traps.
4. Relative humidity levels above 80% in areas where the ice machine or ice transport tube is located may produce excessive condensation that will cause water damage.
5. Contact factory for recommendations on running tubing through a decorative soffit or chase.

Ice production – Horizon Elite 710 series, air-cooled 60 Hz

Inlet water temperature F (C)	Ambient air temperature F (C)					
	60 (16)	70 (21)	80 (27)	90 (32)	100 (38)	lb (kg) production in 24 hr
50 (10)	787 (357)	759 (345)	705 (320)	639 (290)	603 (274)	
60 (16)	750 (341)	702 (319)	666 (302)	624 (283)	570 (259)	
70 (21)	707 (321)	681 (309)	636 (289)	586 (266)	542 (246)	
80 (27)	677 (307)	629 (286)	611 (277)	559 (254)	518 (235)	
90 (32)	642 (291)	600 (272)	580 (263)	539 (245)	497 (226)	

Ice production – Horizon Elite 710 series, air-cooled 50 Hz

Inlet water temperature F (C)	Ambient air temperature F (C)					
	60 (16)	70 (21)	80 (27)	90 (32)	100 (38)	lb (kg) production in 24 hr
50 (10)	664 (301)	617 (280)	576 (261)	538 (244)	500 (227)	
60 (16)	645 (293)	601 (272)	560 (254)	521 (236)	481 (218)	
70 (21)	626 284)	582 (264)	544 (247)	506 (229)	464 (210)	
80 (27)	588 (267)	544 (247)	512 (232)	481 (218)	389 (176)	
90 (32)	557 (252)	519 (235)	487 (221)	455 (207)	328 (149)	

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11 40 01-421

Submittal Sheet

09/15/2026

ITEM# 2.62 - FLOOR TROUGH (1 EA REQ'D)

Advance Tabco FTG-1842

Floor Trough, 42"W x 18"D x 4" deep, 14 gauge 304 stainless steel, includes stainless steel subway grating constructed from 3/16" x 1" bars, removable stainless steel strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	FT-1	Anti-Splash Guard, factory installed (per linear foot)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

FLOOR TROUGHS, DRAINS & WATER RECEPTACLES

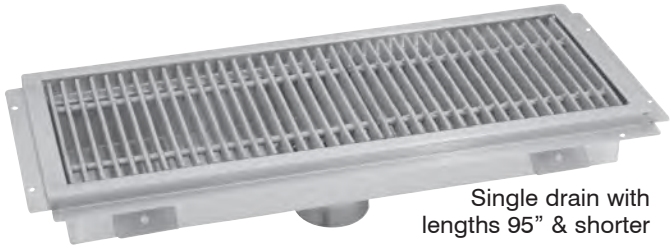
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NSF

Item #: _____ **Qty #:** _____
Model #: _____
Project #: _____

Floor Troughs

4" Depth



Single drain with lengths 95" & shorter



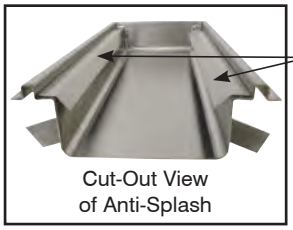
Double drains with lengths 96" & longer

Floor Water Receptacles

2" & 4" Depths Available



FTG-736 water receptacle shown



Cut-Out View of Anti-Splash

FT-1
Optional Anti-Splash Guard
(Per ft. Factory installed)



FT-2
Stainless Steel Strainer Basket
with Handle (Included with all Floor Troughs, Water Receptacles & Floor Drains)

Floor Drain

4" Depth





FD-1
Optional Stainless Steel Grate for Floor Drains

OPTIONAL ACCESSORIES

Model #	Description	QTY
FT-1	Anti-Splash Guard (Per Ft.)	
FT-2	Replacement Strainer Basket	
FT-3	Modify Trough Depth (2 "- 6" Deep. Per Ft.)	
FT-4	Modify Drain Hole Outlet Size (Allow 2" to 8" Dia.)	
FT-5	Grate Upgrade to A.D.A. Compliant (7/16 Gap. Per Ft.)	
FD-1	Floor Drain Stainless Steel Grate	

FEATURES:

Waste receptacle will accommodate up to a 4" waste pipe.

Includes 4" O.D. - 3" Long Plumbing Sleeve.

Removable perforated stainless steel strainer basket with handle provided.

Pitched towards waste.

Gratings Available:

FTG Series: Stainless Steel "Subway Style" grating from 3/16" x 1" solid "304" stainless steel bar. (Not included with Floor Drains. Use Model FD-1). Grating is spaced 9/16" (Inside clearance) between bars.

FFTG Series: Fiberglass "Subway Style" Grating from 5/8" x 1" Non-Slip Medium Grit Polyester Resin (SPF). Grating is spaced 7/8" (Inside clearance) between bars.

Troughs 96" or larger in length made with two (2) drains.

Custom sizes available. Consult factory.

CONSTRUCTION:

All TIG welded.

All external corners welded and polished to a satin finish.

MECHANICAL:

Creased design to ensure proper drainage.

Perimeter flange mounts directly to sub floor.

3/4" vertical step designed to accommodate floor tile installation.

MATERIAL:

14 gauge "304" type stainless steel polished stainless steel grating.

Stainless Steel Grating: "304" stainless steel.

Fiberglass grating: Gray fiberglass composite. Light weight, skid and corrosion resistant.

ADVANCE TABCO
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Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

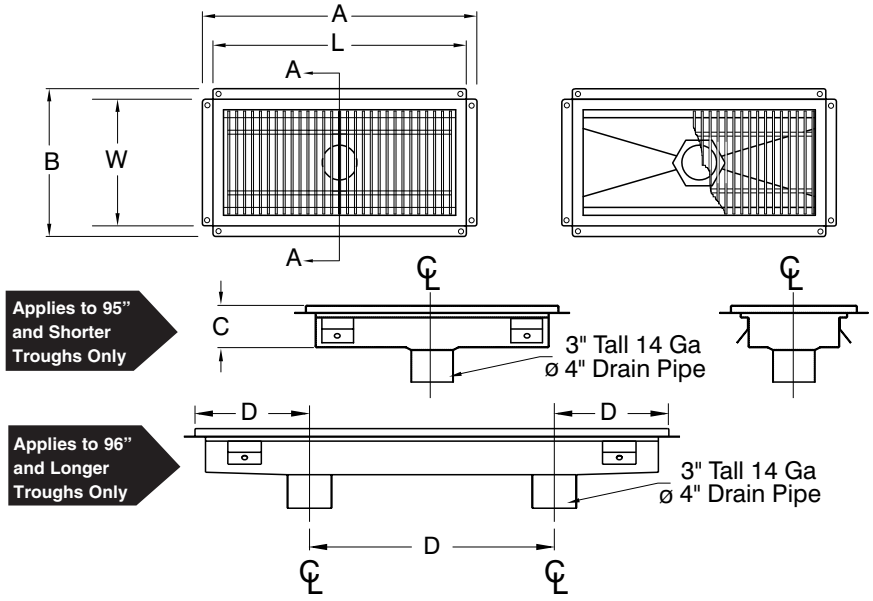
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Email: customer@advancetabco.com or Fax: 631-242-6900

For Smart Fabrication™ Quotes:
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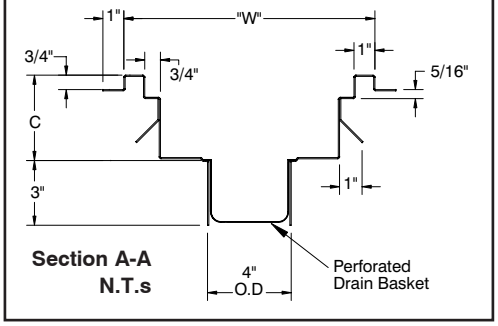
DIMENSIONS and SPECIFICATIONS

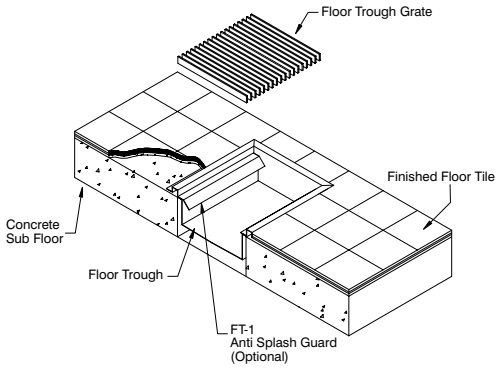
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ALL DIMENSIONS ARE TYPICAL TOL ± .500”



PLUMBING ROUGH-IN





12”, 18” & 24” WIDE FLOOR TROUGHS

Stainless Steel Grating	Wt.	Fiberglass Grating	Wt.	L	W	A	B	C	D
FTG-1224	46 lbs.	FFTG-1224	34 lbs.	24”	12”	26”	14”	4”	-
FTG-1230	56 lbs.	FFTG-1230	37 lbs.	30”	12”	32”	14”	4”	-
FTG-1236	66 lbs.	FFTG-1236	40 lbs.	36”	12”	38”	14”	4”	-
FTG-1242	76 lbs.	FFTG-1242	43 lbs.	42”	12”	44”	14”	4”	-
FTG-1248	86 lbs.	FFTG-1248	46 lbs.	48”	12”	50”	14”	4”	-
FTG-1254	96 lbs.	FFTG-1254	49 lbs.	54”	12”	56”	14”	4”	-
FTG-1260	106 lbs.	FFTG-1260	52 lbs.	60”	12”	62”	14”	4”	-
FTG-1272	116 lbs.	FFTG-1272	55 lbs.	72”	12”	74”	14”	4”	-
FTG-1284	126 lbs.	FFTG-1284	81 lbs.	84”	12”	86”	14”	4”	-
FTG-1296*	146 lbs.	FFTG-1296	90 lbs.	96”	12”	98”	14”	4”	32”
FTG-12108*	166 lbs.	FFTG-12108	99 lbs.	108”	12”	110”	14”	4”	36”
FTG-12120*	180 lbs.	FFTG-12120	108 lbs.	120”	12”	122”	14”	4”	40”
FTG-1824	62 lbs.	FFTG-1824	43 lbs.	24”	18”	26”	20”	4”	-
FTG-1830	74 lbs.	FFTG-1830	47 lbs.	30”	18”	32”	20”	4”	-
FTG-1836	86 lbs.	FFTG-1836	54 lbs.	36”	18”	38”	20”	4”	-
FTG-1842	98 lbs.	FFTG-1842	61 lbs.	42”	18”	44”	20”	4”	-
FTG-1848	110 lbs.	FFTG-1848	69 lbs.	48”	18”	50”	20”	4”	-
FTG-1854	122 lbs.	FFTG-1854	76 lbs.	54”	18”	56”	20”	4”	-
FTG-1860	134 lbs.	FFTG-1860	83 lbs.	60”	18”	62”	20”	4”	-
FTG-1872	146 lbs.	FFTG-1872	90 lbs.	72”	18”	74”	20”	4”	-
FTG-1884	165 lbs.	FFTG-1884	111 lbs.	84”	18”	86”	20”	4”	-
FTG-1896*	187 lbs.	FFTG-1896	125 lbs.	96”	18”	98”	20”	4”	32”
FTG-18108*	208 lbs.	FFTG-18108	138 lbs.	108”	18”	110”	20”	4”	36”
FTG-18120*	229 lbs.	FFTG-18120	150 lbs.	120”	18”	122”	20”	4”	40”
FTG-2424	69 lbs.	FFTG-2424	52 lbs.	24”	24”	26”	26”	4”	-
FTG-2430	81 lbs.	FFTG-2430	59 lbs.	30”	24”	32”	26”	4”	-
FTG-2436	104 lbs.	FFTG-2436	68 lbs.	36”	24”	38”	26”	4”	-
FTG-2442	118 lbs.	FFTG-2442	75 lbs.	42”	24”	44”	26”	4”	-
FTG-2448	131 lbs.	FFTG-2448	83 lbs.	48”	24”	50”	26”	4”	-
FTG-2454	145 lbs.	FFTG-2454	95 lbs.	54”	24”	56”	26”	4”	-
FTG-2460	162 lbs.	FFTG-2460	102 lbs.	60”	24”	62”	26”	4”	-
FTG-2472	195 lbs.	FFTG-2472	119 lbs.	72”	24”	74”	26”	4”	-
FTG-2484	218 lbs.	FFTG-2484	137 lbs.	84”	24”	86”	26”	4”	-
FTG-2496*	243 lbs.	FFTG-2496	153 lbs.	96”	24”	98”	26”	4”	32”
FTG-24108*	274 lbs.	FFTG-24108	168 lbs.	108”	24”	110”	26”	4”	36”
FTG-24120*	310 lbs.	FFTG-24120	188 lbs.	120”	24”	122”	26”	4”	40”

***Troughs 96” or larger in length made with two (2) drains.**

7.5” WIDE FLOOR WATER RECEPTACLES (4” Depth)

Stainless Steel Grating	L	W	A	B	C	D	Wt.
FTG-724	24”	7.5”	26”	9.5”	4”	-	44 lbs.
FTG-730	30”	7.5”	32”	9.5”	4”	-	45 lbs.
FTG-736	36”	7.5”	38”	9.5”	4”	-	63 lbs.
FTG-748	48”	7.5”	50”	9.5”	4”	-	82 lbs.
FTG-760	60”	7.5”	62”	9.5”	4”	-	101 lbs.
FTG-772	72”	7.5”	74”	9.5”	4”	-	110 lbs.
FTG-784	84”	7.5”	86”	9.5”	4”	-	119 lbs.
FTG-796	96”	7.5”	98”	9.5”	4”	32”	138 lbs.
FTG-7108	108”	7.5”	110”	9.5”	4”	36”	157 lbs.
FTG-7120	120”	7.5”	122”	9.5”	4”	40”	170 lbs.

12” WIDE FLOOR WATER RECEPTACLES (2” Depth)

Stainless Steel Grating	L	W	A	B	C	Wt.
FRG-24	24”	12”	26”	14”	2”	44 lbs.
FRG-36	36”	12”	38”	14”	2”	63 lbs.
FRG-48	48”	12”	50”	14”	2”	82 lbs.

12” WIDE FLOOR DRAIN (4” Depth)

MODEL	L	W	A	B	C	Wt.
FDR-1212	12”	12”	14”	14”	4”	26 lbs.

CUSTOM SIZES AVAILABLE!

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STAINLESS STEEL

FLOOR TROUGHS, DRAINS & WATER RECEPTACLES

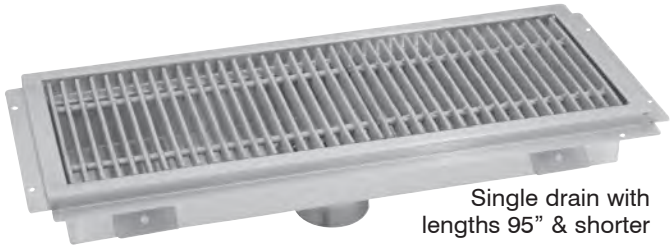
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NSF

Item #: _____ Qty #: _____
Model #: _____
Project #: _____

Floor Troughs

4" Depth



Single drain with lengths 95" & shorter



Double drains with lengths 96" & longer

Floor Water Receptacles

2" & 4" Depths Available



FTG-736 water receptacle shown



Cut-Out View of Anti-Splash

FT-1
Optional Anti-Splash Guard
(Per ft. Factory installed)



FT-2
Stainless Steel Strainer Basket
with Handle (Included with all Floor Troughs, Water Receptacles & Floor Drains)

Floor Drain

4" Depth





FD-1
Optional Stainless Steel Grate for Floor Drains

OPTIONAL ACCESSORIES

Model #	Description	QTY
FT-1	Anti-Splash Guard (Per Ft.)	
FT-2	Replacement Strainer Basket	
FT-3	Modify Trough Depth (2 "- 6" Deep. Per Ft.)	
FT-4	Modify Drain Hole Outlet Size (Allow 2" to 8" Dia.)	
FT-5	Grate Upgrade to A.D.A. Compliant (7/16 Gap. Per Ft.)	
FD-1	Floor Drain Stainless Steel Grate	

FEATURES:

Waste receptacle will accommodate up to a 4" waste pipe.

Includes 4" O.D. - 3" Long Plumbing Sleeve.

Removable perforated stainless steel strainer basket with handle provided.

Pitched towards waste.

Gratings Available:

FTG Series: Stainless Steel "Subway Style" grating from 3/16" x 1" solid "304" stainless steel bar. (Not included with Floor Drains. Use Model FD-1). Grating is spaced 9/16" (Inside clearance) between bars.

FFTG Series: Fiberglass "Subway Style" Grating from 5/8" x 1" Non-Slip Medium Grit Polyester Resin (SPF). Grating is spaced 7/8" (Inside clearance) between bars.

Troughs 96" or larger in length made with two (2) drains.

Custom sizes available. Consult factory.

CONSTRUCTION:

All TIG welded.

All external corners welded and polished to a satin finish.

MECHANICAL:

Creased design to ensure proper drainage.

Perimeter flange mounts directly to sub floor.

3/4" vertical step designed to accommodate floor tile installation.

MATERIAL:

14 gauge "304" type stainless steel polished stainless steel grating.

Stainless Steel Grating: "304" stainless steel.

Fiberglass grating: Gray fiberglass composite. Light weight, skid and corrosion resistant.

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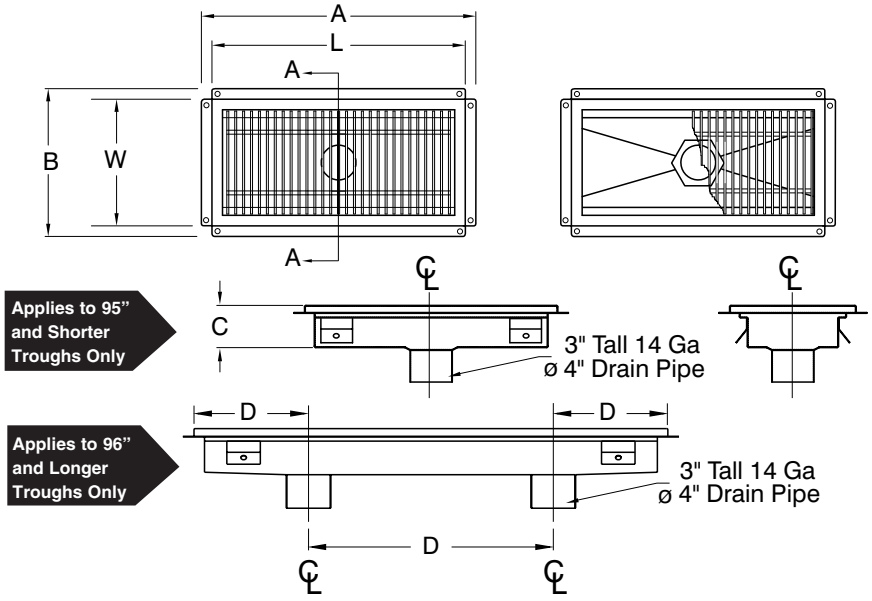
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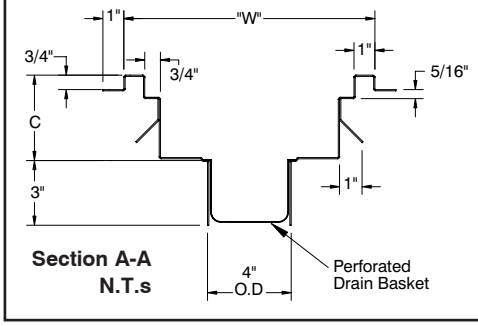
DIMENSIONS and SPECIFICATIONS

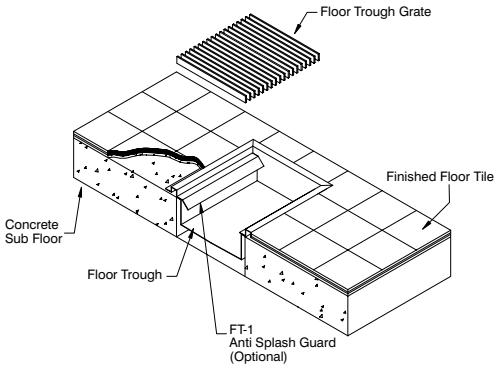
11 40 01-425

ALL DIMENSIONS ARE TYPICAL TOL ± .500”



PLUMBING ROUGH-IN





12”, 18” & 24” WIDE FLOOR TROUGHS

Stainless Steel Grating	Wt.	Fiberglass Grating	Wt.	L	W	A	B	C	D
FTG-1224	46 lbs.	FFTG-1224	34 lbs.	24”	12”	26”	14”	4”	-
FTG-1230	56 lbs.	FFTG-1230	37 lbs.	30”	12”	32”	14”	4”	-
FTG-1236	66 lbs.	FFTG-1236	40 lbs.	36”	12”	38”	14”	4”	-
FTG-1242	76 lbs.	FFTG-1242	43 lbs.	42”	12”	44”	14”	4”	-
FTG-1248	86 lbs.	FFTG-1248	46 lbs.	48”	12”	50”	14”	4”	-
FTG-1254	96 lbs.	FFTG-1254	49 lbs.	54”	12”	56”	14”	4”	-
FTG-1260	106 lbs.	FFTG-1260	52 lbs.	60”	12”	62”	14”	4”	-
FTG-1272	116 lbs.	FFTG-1272	55 lbs.	72”	12”	74”	14”	4”	-
FTG-1284	126 lbs.	FFTG-1284	81 lbs.	84”	12”	86”	14”	4”	-
FTG-1296*	146 lbs.	FFTG-1296	90 lbs.	96”	12”	98”	14”	4”	32”
FTG-12108*	166 lbs.	FFTG-12108	99 lbs.	108”	12”	110”	14”	4”	36”
FTG-12120*	180 lbs.	FFTG-12120	108 lbs.	120”	12”	122”	14”	4”	40”
FTG-1824	62 lbs.	FFTG-1824	43 lbs.	24”	18”	26”	20”	4”	-
FTG-1830	74 lbs.	FFTG-1830	47 lbs.	30”	18”	32”	20”	4”	-
FTG-1836	86 lbs.	FFTG-1836	54 lbs.	36”	18”	38”	20”	4”	-
FTG-1842	98 lbs.	FFTG-1842	61 lbs.	42”	18”	44”	20”	4”	-
FTG-1848	110 lbs.	FFTG-1848	69 lbs.	48”	18”	50”	20”	4”	-
FTG-1854	122 lbs.	FFTG-1854	76 lbs.	54”	18”	56”	20”	4”	-
FTG-1860	134 lbs.	FFTG-1860	83 lbs.	60”	18”	62”	20”	4”	-
FTG-1872	146 lbs.	FFTG-1872	90 lbs.	72”	18”	74”	20”	4”	-
FTG-1884	165 lbs.	FFTG-1884	111 lbs.	84”	18”	86”	20”	4”	-
FTG-1896*	187 lbs.	FFTG-1896	125 lbs.	96”	18”	98”	20”	4”	32”
FTG-18108*	208 lbs.	FFTG-18108	138 lbs.	108”	18”	110”	20”	4”	36”
FTG-18120*	229 lbs.	FFTG-18120	150 lbs.	120”	18”	122”	20”	4”	40”
FTG-2424	69 lbs.	FFTG-2424	52 lbs.	24”	24”	26”	26”	4”	-
FTG-2430	81 lbs.	FFTG-2430	59 lbs.	30”	24”	32”	26”	4”	-
FTG-2436	104 lbs.	FFTG-2436	68 lbs.	36”	24”	38”	26”	4”	-
FTG-2442	118 lbs.	FFTG-2442	75 lbs.	42”	24”	44”	26”	4”	-
FTG-2448	131 lbs.	FFTG-2448	83 lbs.	48”	24”	50”	26”	4”	-
FTG-2454	145 lbs.	FFTG-2454	95 lbs.	54”	24”	56”	26”	4”	-
FTG-2460	162 lbs.	FFTG-2460	102 lbs.	60”	24”	62”	26”	4”	-
FTG-2472	195 lbs.	FFTG-2472	119 lbs.	72”	24”	74”	26”	4”	-
FTG-2484	218 lbs.	FFTG-2484	137 lbs.	84”	24”	86”	26”	4”	-
FTG-2496*	243 lbs.	FFTG-2496	153 lbs.	96”	24”	98”	26”	4”	32”
FTG-24108*	274 lbs.	FFTG-24108	168 lbs.	108”	24”	110”	26”	4”	36”
FTG-24120*	310 lbs.	FFTG-24120	188 lbs.	120”	24”	122”	26”	4”	40”

***Troughs 96” or larger in length made with two (2) drains.**

7.5” WIDE FLOOR WATER RECEPTACLES (4” Depth)

Stainless Steel Grating	L	W	A	B	C	D	Wt.
FTG-724	24”	7.5”	26”	9.5”	4”	-	44 lbs.
FTG-730	30”	7.5”	32”	9.5”	4”	-	45 lbs.
FTG-736	36”	7.5”	38”	9.5”	4”	-	63 lbs.
FTG-748	48”	7.5”	50”	9.5”	4”	-	82 lbs.
FTG-760	60”	7.5”	62”	9.5”	4”	-	101 lbs.
FTG-772	72”	7.5”	74”	9.5”	4”	-	110 lbs.
FTG-784	84”	7.5”	86”	9.5”	4”	-	119 lbs.
FTG-796	96”	7.5”	98”	9.5”	4”	32”	138 lbs.
FTG-7108	108”	7.5”	110”	9.5”	4”	36”	157 lbs.
FTG-7120	120”	7.5”	122”	9.5”	4”	40”	170 lbs.

12” WIDE FLOOR WATER RECEPTACLES (2” Depth)

Stainless Steel Grating	L	W	A	B	C	Wt.
FRG-24	24”	12”	26”	14”	2”	44 lbs.
FRG-36	36”	12”	38”	14”	2”	63 lbs.
FRG-48	48”	12”	50”	14”	2”	82 lbs.

12” WIDE FLOOR DRAIN (4” Depth)

MODEL	L	W	A	B	C	Wt.
FDR-1212	12”	12”	14”	14”	4”	26 lbs.

CUSTOM SIZES AVAILABLE!

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© ADVANCE TABCO, OCTOBER 2022

11 40 01-426

Submittal Sheet

09/15/2026

ITEM# 2.63 - WORK TABLE, STAINLESS STEEL TOP (1 EA REQ'D)

Advance Tabco KSS-309

Work Table, 108"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	TA-31	Side Splash, 5" high (each)

ADVANCE TABCO
SMA

STAINLESS STEEL

11 40 01-427

WORK TABLES

PREMIUM Series - 5" Backsplash - Undershelf Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Splash on Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with a 1 5/8" sanitary rolled rim edge on front, 1 5/8" square side edges, and a 5" splash with a 1" return on the rear side.

24" wide tables supplied with TWO hat channels stud welded to reinforce and maintain a level working surface. 30" and 36" wide tables supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts and bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

KSS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel.
1" adjustable stainless steel bullet feet.
Stainless steel gussets.

KLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel.
1" adjustable plastic bullet feet.
Galvanized steel gussets.

KSS-Series:
Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KSS-240	KSS-300	
24"	KSS-242	KSS-302	KSS-362
36"	KSS-243	KSS-303	KSS-363
48"	KSS-244	KSS-304	KSS-364
60"	KSS-245	KSS-305	KSS-365
72"	KSS-246	KSS-306	KSS-366
84"	KSS-247	KSS-307	KSS-367
*96"	KSS-248	KSS-308	KSS-368
*108"	KSS-249	KSS-309	KSS-369
*120"	KSS-2410	KSS-3010	KSS-3610
*132"	KSS-2411	KSS-3011	KSS-3611
*144"	KSS-2412	KSS-3012	KSS-3612

NSF

KLG-Series:
Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KLG-240	KLG-300	
24"	KLG-242	KLG-302	KLG-362
36"	KLG-243	KLG-303	KLG-363
48"	KLG-244	KLG-304	KLG-364
60"	KLG-245	KLG-305	KLG-365
72"	KLG-246	KLG-306	KLG-366
84"	KLG-247	KLG-307	KLG-367
*96"	KLG-248	KLG-308	KLG-368
*108"	KLG-249	KLG-309	KLG-369
*120"	KLG-2410	KLG-3010	KLG-3610
*132"	KLG-2411	KLG-3011	KLG-3611
*144"	KLG-2412	KLG-3012	KLG-3612

*Units 8 ft. and larger are furnished with six (6) legs

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

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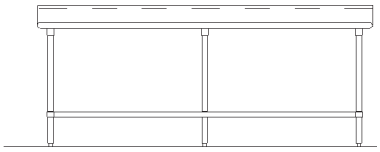
DETAILS and SPECIFICATIONS 11 40 01-428

ALL DIMENSIONS ARE TYPICAL TOL ± .500”

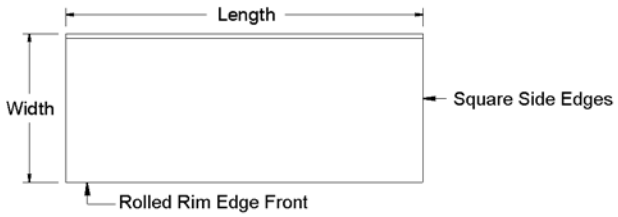
All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

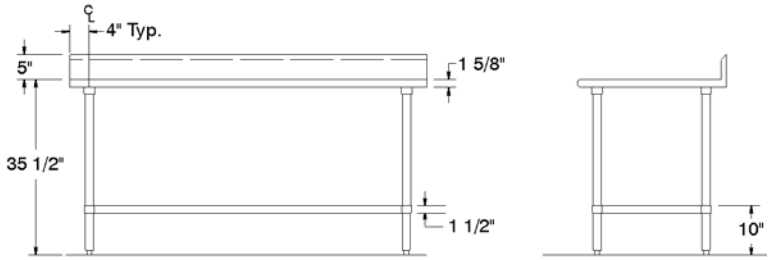
KSS & KLG Series
Undershelf Style
5” Backsplash

Finished size of undershelf = Length minus 5 3/4”
Width minus 5 3/4”



Units 8ft. and larger are furnished with six (6) legs





KSS-Series: Stainless Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	KSS-240	55 lbs.	KSS-300	70 lbs.		
24”	KSS-242	50 lbs.	KSS-302	56 lbs.	KSS-362	86 lbs.
36”	KSS-243	66 lbs.	KSS-303	77 lbs.	KSS-363	92 lbs.
48”	KSS-244	81 lbs.	KSS-304	92 lbs.	KSS-364	101 lbs.
60”	KSS-245	95 lbs.	KSS-305	111 lbs.	KSS-365	121 lbs.
72”	KSS-246	113 lbs.	KSS-306	129 lbs.	KSS-366	142 lbs.
84”	KSS-247	135 lbs.	KSS-307	153 lbs.	KSS-367	169 lbs.
96”	KSS-248	150 lbs.	KSS-308	171 lbs.	KSS-368	189 lbs.
108”	KSS-249	165 lbs.	KSS-309	195 lbs.	KSS-369	260 lbs.
120”	KSS-2410	268 lbs.	KSS-3010	294 lbs.	KSS-3610	315 lbs.
132”	KSS-2411	301 lbs.	KSS-3011	331 lbs.	KSS-3611	358 lbs.
144”	KSS-2412	316 lbs.	KSS-3012	346 lbs.	KSS-3612	373 lbs.

KLG-Series: Galvanized Steel Legs & Undershelf

L	24” Wide	Wt.	30” Wide	Wt.	36” Wide	Wt.
30”	KLG-240	55 lbs.	KLG-300	70 lbs.		
24”	KLG-242	50 lbs.	KLG-302	56 lbs.	KLG-362	86 lbs.
36”	KLG-243	66 lbs.	KLG-303	77 lbs.	KLG-363	92 lbs.
48”	KLG-244	81 lbs.	KLG-304	92 lbs.	KLG-364	101 lbs.
60”	KLG-245	95 lbs.	KLG-305	111 lbs.	KLG-365	121 lbs.
72”	KLG-246	113 lbs.	KLG-306	129 lbs.	KLG-366	142 lbs.
84”	KLG-247	135 lbs.	KLG-307	153 lbs.	KLG-367	169 lbs.
96”	KLG-248	150 lbs.	KLG-308	171 lbs.	KLG-368	189 lbs.
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120”	KLG-2410	268 lbs.	KLG-3010	294 lbs.	KLG-3610	315 lbs.
132”	KLG-2411	301 lbs.	KLG-3011	331 lbs.	KLG-3611	358 lbs.
144”	KLG-2412	316 lbs.	KLG-3012	346 lbs.	KLG-3612	373 lbs.

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11 40 01-429

TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



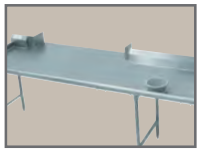
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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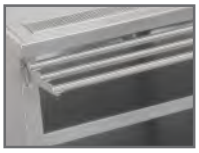
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TABLE MODIFICATIONS & ACCESSORIES

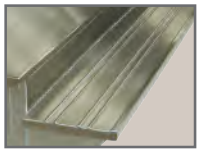
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



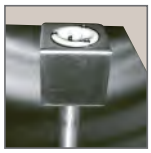
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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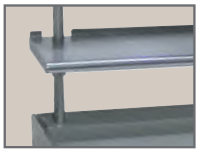
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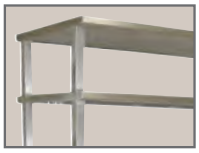
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



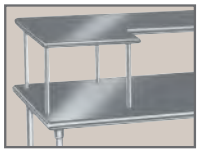
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

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11 40 01-433

Submittal Sheet

09/15/2026

ITEM# 2.64 - WORK SINK, WELD-IN (1 EA REQ'D)

Advance Tabco TA-11N

Sink Welded Into Table Top, 18"W x 18"D x 14" deep bowl, includes faucet, NSF (must specify sink location)

Welded Sinks Into Table Top

Sink Bowls

Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Flat Top w/ K-50 Deck Mount Faucet Shown



10" Backsplash w/ K-1 Splash Mount Faucet Shown

Includes Faucet & **K-6** 3-1/2" Basket Drain(s)

Size A	Size B	Single Bowl Model#	Double Bowl Model#
10"	14" x 5"	TA-11Q	TA-11Q-2†
10"	14" x 10"	TA-11F	TA-11F-2†
14"	16" x 12"	TA-11J	TA-11J-2
16"	20" x 8"	TA-11A**	TA-11A-2**
16"	20" x 12"	TA-11B**	TA-11B-2**
16"	20" x 14"	TA-11V**	TA-11V-2**
16"	24" x 14"	TA-11K**	TA-11K-2**
18"	18" x 14"	TA-11N	TA-11N-2
18"	24" x 14"	TA-11L	TA-11L-2
20"	20" x 8"	TA-11C*	TA-11C-2*
20"	20" x 12"	TA-11D*	TA-11D-2*
20"	20" x 14"	TA-11W*	TA-11W-2*
20"	24" x 14"	TA-11P*	TA-11P-2*
20"	30" x 14"	TA-11S*	TA-11S-2*
24"	24" x 14"	TA-11E*	TA-11E-2*
24"	30" x 14"	TA-11T*	TA-11T-2*
24"	36" x 14"	TA-11R*	TA-11R-2*
28"	20" x 14"	TA-11G*	TA-11G-2*

Flat Top, 1", 1-1/2" & 5 Backsplash Include Deck Mount Faucet

- Single Sink Bowl provided with K-50 Swing Spout Faucet
- Double Sink Bowls provided with K-53 Swing Spout Faucet

10" Backsplash Include Splash Mount Faucet

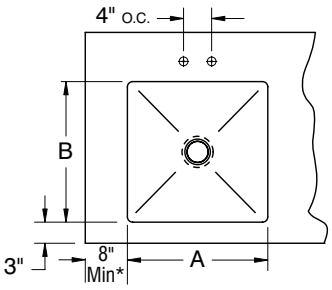
- Single & Double Sink Bowls provided with K-1 Swing Spout Faucet Splash Mount Faucet Available On 5" Backsplash - Add TA-11Z

* Only Installed In Tables 30" Wide or Wider

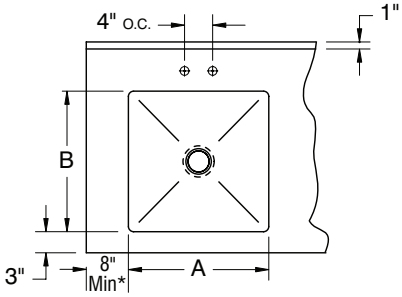
** Bowls Are Turned In 24" Wide Tables

† K-50 Swing Spout Faucet (Double Bowl)

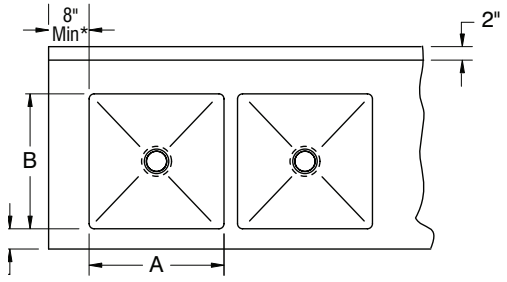
FLAT TOP, 1" or 1-1/2" REAR SPLASH



5" REAR SPLASH with 1" RETURN



10" REAR SPLASH with 2" RETURN



*4" minimum on enclosed base tables

⚠ **WARNING:** Equipment that include faucets on this page may contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Faucets & Accessories

_____	K-2B	Poly-Vance Sink Cutting Board for 14" x 16" Deep Drawn Bowls
_____	K-2C	Poly-Vance Sink Cutting Board for 16" x 20" Deep Drawn Bowls
_____	K-2D	Poly-Vance Sink Cutting Board for 18" x 24" Deep Drawn Bowls
_____	K-2E	Poly-Vance Sink Cutting Board for 20" x 20" Deep Drawn Bowls
_____	K-2F	Poly-Vance Sink Cutting Board for 24" x 24" Deep Drawn Bowls
_____	K-2J	Poly-Vance Sink Cutting Board for 18" x 18" Deep Drawn Bowls
_____	K-4	Lever Drain Bracket
_____	K-5	Lever Drain
_____	K-12	Deck Mounted Soap Dispenser
_____	K-15	Lever Drain With Overflow
_____	K-50	8" Deck Mounted 4" O.C. Swing Spout Faucet
_____	K-50OMIT	Omit Swing Spout
_____	K-52	3 1/2" Spout Deck Mounted 4" O.C. Gooseneck Faucet
_____	K-52OMIT	Omit Swing Spout Gooseneck Faucet
_____	K-53	12" Deck Mounted 4" O.C. Swing Spout Faucet
_____	K-54	8-1/4" Water Filler Faucet
_____	K-54A	12" Water Filler Faucet
_____	K-55	8 1/2" Spout 4" O.C. Deck Mounted Gooseneck Faucet
_____	K-60	4" O.C. Splash Mounted Gooseneck Faucet
_____	K-62	X.H.D. 4" O.C. Deck Mounted Gooseneck Faucet
_____	K-105	14" Splash Mounted 8" O.C. Faucet
_____	K-112	Extra Heavy Duty 12" Splash Mounted Faucets
_____	K-316-LUHA	Wrist Handles For Splash Mounted Faucets
_____	K-350	Residential Finish & Packaging
_____	K-452	6" x 9" Control Bracket
_____	K-453	14" x 16" Control Bracket
_____	K-460	Installation Of Disposal Cone w/ 6" x 9" Control Bracket
_____	K-461	Installation Of Collar w/ 6" x 9" Control Bracket
_____	K-470	14" Deep Bowls
_____	K-472	Faucet Hole Revision
_____	DTA-100	Prerinse Basket for 20" x 20" Bowls
_____	DTA-125	Prerinse Basket for 16" x 20" Bowls

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11 40 01-435

Submittal Sheet

09/15/2026

ITEM# 2.65 - WORK TABLE, STAINLESS STEEL TOP (1 EA REQ'D)

Advance Tabco KSS-307

Work Table, 84"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

ACCESSORIES

Mfr	Qty	Model	Spec
Advance Tabco	1	TA-61	Modification to reduce length and/or width of table, start with next largest size then add "TA-61" to model number
Advance Tabco	1	TA-31	Side Splash, 5" high (each)

ADVANCE TABCO SMA

STAINLESS STEEL

11 40 01-436

WORK TABLES

PREMIUM Series - 5" Backsplash - Undershelf Style



Item #: _____ Qty #: _____

Model #: _____

Project #: _____



Rolled Rim Edges on Front & Splash on Back and Square Side Edges



Featuring as Standard:
"THE PROVEN"
ORIGINAL ADVANCE TABCO
Adjustable Undershelf with Die Cast Leg Clamp

FEATURES:

Top is furnished with a 1 5/8" sanitary rolled rim edge on front, 1 5/8" square side edges, and a 5" splash with a 1" return on the rear side.

24" wide tables supplied with TWO hat channels stud welded to reinforce and maintain a level working surface. 30" and 36" wide tables supplied with THREE hat channels.

Pre-engineered welded angle adapters insure ease of future drawer installation.

Aluminum die cast "leg-to-shelf" clamp secures shelf to leg eliminating unsightly nuts and bolts. Undershelf is adjustable.

CONSTRUCTION:

All TIG welded. Exposed weld areas polished to match adjacent surfaces.

Entire top mechanically polished to a satin finish.

Top is sound deadened.

Roll formed embossed galvanized hat channels are secured to top by means of structural adhesive and weld studs.

Gussets welded to support hat sections.

MATERIAL:

KSS-SERIES: Stainless Steel Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge stainless steel.
LEGS: 1 5/8" diameter tubular stainless steel.
1" adjustable stainless steel bullet feet.
Stainless steel gussets.

KLG-SERIES: Galvanized Legs & Undershelf

TOP: 14 gauge stainless steel type "304" series.
SHELF: 18 gauge galvanized steel.
LEGS: 1 5/8" diameter tubular galvanized steel.
1" adjustable plastic bullet feet.
Galvanized steel gussets.

KSS-Series:
Stainless Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KSS-240	KSS-300	
24"	KSS-242	KSS-302	KSS-362
36"	KSS-243	KSS-303	KSS-363
48"	KSS-244	KSS-304	KSS-364
60"	KSS-245	KSS-305	KSS-365
72"	KSS-246	KSS-306	KSS-366
84"	KSS-247	KSS-307	KSS-367
*96"	KSS-248	KSS-308	KSS-368
*108"	KSS-249	KSS-309	KSS-369
*120"	KSS-2410	KSS-3010	KSS-3610
*132"	KSS-2411	KSS-3011	KSS-3611
*144"	KSS-2412	KSS-3012	KSS-3612

NSF

KLG-Series:
Galvanized Steel Legs & Undershelf

L	24" Wide	30" Wide	36" Wide
30"	KLG-240	KLG-300	
24"	KLG-242	KLG-302	KLG-362
36"	KLG-243	KLG-303	KLG-363
48"	KLG-244	KLG-304	KLG-364
60"	KLG-245	KLG-305	KLG-365
72"	KLG-246	KLG-306	KLG-366
84"	KLG-247	KLG-307	KLG-367
*96"	KLG-248	KLG-308	KLG-368
*108"	KLG-249	KLG-309	KLG-369
*120"	KLG-2410	KLG-3010	KLG-3610
*132"	KLG-2411	KLG-3011	KLG-3611
*144"	KLG-2412	KLG-3012	KLG-3612

*Units 8 ft. and larger are furnished with six (6) legs

Create Your Own Efficient Workstation with the Available Standard Accessories (Visit Section K)

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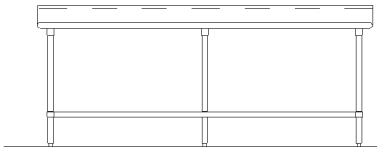
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GEORGIA Fax: (770) 775-5625
TEXAS Fax: (972) 932-4795
NEVADA Fax: (775) 972-1578

DETAILS and SPECIFICATIONS 11 40 01-437

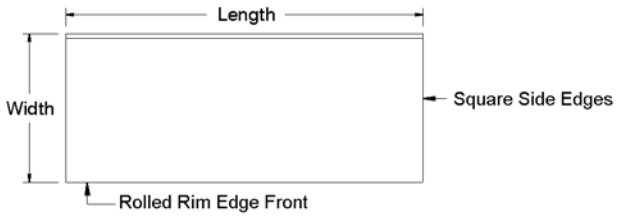
ALL DIMENSIONS ARE TYPICAL TOL ± .500" All Units Shipped Unassembled (KD) for Reduced Shipping Costs.

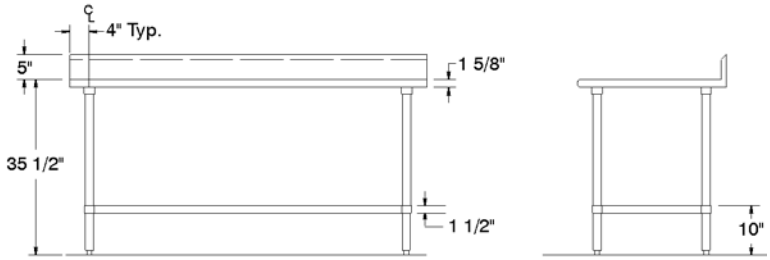
KSS & KLG Series
Undershelf Style
5" Backsplash

Finished size of undershelf = Length minus 5 3/4"
Width minus 5 3/4"



Units 8ft. and larger are furnished with six (6) legs





KSS-Series: Stainless Steel Legs & Undershelf

L	24" Wide	Wt.	30" Wide	Wt.	36" Wide	Wt.
30"	KSS-240	55 lbs.	KSS-300	70 lbs.		
24"	KSS-242	50 lbs.	KSS-302	56 lbs.	KSS-362	86 lbs.
36"	KSS-243	66 lbs.	KSS-303	77 lbs.	KSS-363	92 lbs.
48"	KSS-244	81 lbs.	KSS-304	92 lbs.	KSS-364	101 lbs.
60"	KSS-245	95 lbs.	KSS-305	111 lbs.	KSS-365	121 lbs.
72"	KSS-246	113 lbs.	KSS-306	129 lbs.	KSS-366	142 lbs.
84"	KSS-247	135 lbs.	KSS-307	153 lbs.	KSS-367	169 lbs.
96"	KSS-248	150 lbs.	KSS-308	171 lbs.	KSS-368	189 lbs.
108"	KSS-249	165 lbs.	KSS-309	195 lbs.	KSS-369	260 lbs.
120"	KSS-2410	268 lbs.	KSS-3010	294 lbs.	KSS-3610	315 lbs.
132"	KSS-2411	301 lbs.	KSS-3011	331 lbs.	KSS-3611	358 lbs.
144"	KSS-2412	316 lbs.	KSS-3012	346 lbs.	KSS-3612	373 lbs.

KLG-Series: Galvanized Steel Legs & Undershelf

L	24" Wide	Wt.	30" Wide	Wt.	36" Wide	Wt.
30"	KLG-240	55 lbs.	KLG-300	70 lbs.		
24"	KLG-242	50 lbs.	KLG-302	56 lbs.	KLG-362	86 lbs.
36"	KLG-243	66 lbs.	KLG-303	77 lbs.	KLG-363	92 lbs.
48"	KLG-244	81 lbs.	KLG-304	92 lbs.	KLG-364	101 lbs.
60"	KLG-245	95 lbs.	KLG-305	111 lbs.	KLG-365	121 lbs.
72"	KLG-246	113 lbs.	KLG-306	129 lbs.	KLG-366	142 lbs.
84"	KLG-247	135 lbs.	KLG-307	153 lbs.	KLG-367	169 lbs.
96"	KLG-248	150 lbs.	KLG-308	171 lbs.	KLG-368	189 lbs.
108"	KLG-249	165 lbs.	KLG-309	195 lbs.	KLG-369	260 lbs.
120"	KLG-2410	268 lbs.	KLG-3010	294 lbs.	KLG-3610	315 lbs.
132"	KLG-2411	301 lbs.	KLG-3011	331 lbs.	KLG-3611	358 lbs.
144"	KLG-2412	316 lbs.	KLG-3012	346 lbs.	KLG-3612	373 lbs.

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11 40 01-438

TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



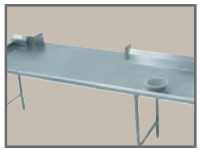
TA-56
5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

QTY.		
____	CDR-5	Condiment Holder (Accommodates 5 Bins)
____	TA-1	Notch Backsplash For Roll Up Door w/ Pass-Thru
____	TA-3	Stainless Steel Hat Channel & Gusset Upgrade
____	TA-7	10" Partial Splash
____	TA-8	Column Notch in Rear Splash (Includes Splash)
____	TA-10	5" Partial Splash
____	TA-12	Countertop Edge
____	TA-22	Square Edge Table
____	TA-28	Cut-Out For Cold Well. Incudes Louvered Doors
____	TA-29	16 Ga. 304 Rear Splash Capping Strip w/Adhesive Backing
____	TA-30	1-1/2" Side Splash
____	TA-30A	1-1/2" Turn Up For Table Tops
____	TA-31	5" Side Splash
____	TA-32	10" Side Splash
____	TA-34	Top Cut-Out
____	TA-34A	Top Cut-Out for Undermount Well
____	TA-35	Splash Cut-Out
____	TA-41	Poly-Vance 5/8" Cutting Board
____	TA-56	5" NSF Partition
____	TA-56A	18" NSF Partition
____	TA-57	Prepare Welded Field Joint (Welded in field by others)
____	TA-57A	Bolted Field Joint (Bolted in field by others)
____	TA-57B	Hairline Field Joint
____	TA-58	Stepdown to 24" Working Height
____	TA-64	Urn Trough (Factory installation only)
____	TA-75	Mitered Edge
____	TA-76	Paint on Sound Deadening
____	TA-79	Flour Trough (Factory installation only)
____	TA-82	Scrap Chute (6" dia. opening)
____	TA-84	Simple Pass-Thru
____	TA-87	Enclosed Rear Splash
____	TA-91	Poly Retaining Clips Includes TA-22 (S/S top table)

QTY.		
____	TA-93	Wall Brackets (Includes 2. For 5" & 10 1/2" splash only)
____	TA-96A	Can Opener Provision for Openers with Bolt-on Base (Customer to provide location)
____	TA-96B	Can Opener Surface Mount Provision with 4" S/S Tube for Openers w/o Base (Customer to provide location)
____	TA-96C	Can Opener Spacer Plate Provision for Use on Tables With Countertop Edge & Can Opener Base (Customer to provide location)
____	TA-100	Bull Nose All Sides of Worktable
____	TA-101	Rear Tray Lock
____	TA-106	Mirror HI-LITE Edge
____	TA-107	Vacuum Breaker Holes on Tables (Includes Backsplash with 2" Return)
____	TA-108	2" Hole with Grommet for Appliance Cord
____	TA-112	Hubble Outlet
____	TA-113	Notch Top for Buyout Unit
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-366A	Heavy duty Understructure Top
____	TA-502	Install Advnace Tabco Hot Food Unit In Work Table Top (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)
____	TA-521	Drop-In urn Trough 1'
____	TA-522	Drop-In urn Trough 2'
____	TA-523	Drop-In urn Trough 3'
____	TA-524	Drop-In urn Trough 4'
____	TA-525	Drop-In urn Trough 5'
____	TA-526	Drop-In urn Trough 6'
____	TA-527	Drop-In urn Trough 7'
____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
____	TA-550	Install Customer Supplied Buyout Items (Does not include wiring. Consult factory)
____	TA-551	Installation of Hot Food Wells. (Requires TA-34 Top Cut-Out & TA-27 Control Panel. Does not include wiring. Consult factory)

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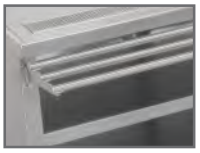
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TABLE MODIFICATIONS & ACCESSORIES

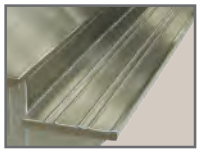
BASE MODIFICATIONS



TA-39
Louvered Hinged Doors



TA-73
Drop-Down Tray Slide



TA-74
Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

QTY.		
____	TA-4	Removable Access Panel
____	TA-4A	Luvered Panel
____	TA-5	Curb Mounting Provision
____	TA-15	Provision for Built In Drawer Warmer
____	TA-23	Welded Set-Up Table/Crating
____	TA-24	Shell Crating
____	TA-27	Control Panel (Must add TA-34A or TA-34B)
____	TA-36A	Sliding/Hinge Stainless Steel Doors
____	TA-36B	1/2 Height Stainless Steel Hinge Doors
____	TA-36C	Hinged door with Trash Flap
____	TA-37	Stainless Enclosed Base
____	TA-39	24" Louvered Hinged Doors
____	TA-40	Remove Undershelf in Cabinet Base For Slide in Buyout
____	TA-42	Interior Partition (2.5"x30")
____	TA-43	Filler Panel (3"x30" with Flanged Feet)
____	TA-44	K.D. Aluminum Pan Rack Slides (6 slides. Table min. lgth. 30")
____	TA-45	K.D. Aluminum Glass Rack Slides (3 slides. Table min. lgth. 3 feet)
____	TA-46	Door Locks

QTY.		
____	TA-48	12"x12" Cut-Out in Back Panel/Undershelf for Plumbing
____	TA-54	Removable Kick Plate
____	TA-55	Remove Back Panel (on Enclosed Base)
____	TA-63	Removable Shelving (In addition to standard shelf & table width)
____	TA-70	S/S Tubular Tray Divider (12" sections)
____	TA-73	Tubular Tray Slide w/Dropdown (Stationary Tray Slide Available. Factory installation only)
____	TA-74	Solid Tray Slide
____	TA-92	12" Apron (in front of sink)
____	TA-92A	17" Stainless Steel Apron to Cover Sink Bowls and Support Lever Drain Handles
____	TA-116	Adjustable Enclosed Base Cabinet Mid Shelf- Add to Price of Enclosed Base Table with Fixed Mid Shelf **(M)**. Shelves Over 36" In Length Require Multiple Sections With Center Partition. For Partial Shelves Add To Price Of Shelf.
____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



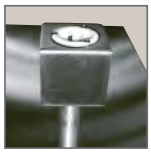
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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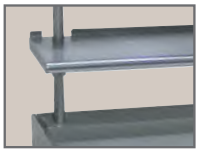
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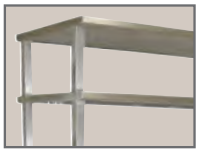
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1" Turn Up



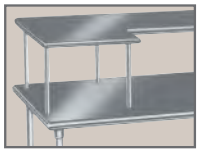
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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TABLE MODIFICATIONS & ACCESSORIES

TOP MODIFICATIONS



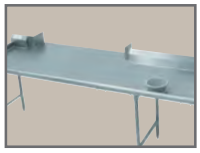
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5" NSF Partition



TA-523
Drop-In Urn Trough



CDR-5
Condiment Holder



TA-84
Pass-Thru



TA-108
Grommet For Cords

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____	TA-135	Plate Shelf (Undercounter Mounted)
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____	TA-528	Drop-In urn Trough 8'
____	TA-529	Drop-In urn Trough 9'
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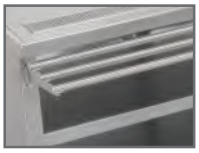
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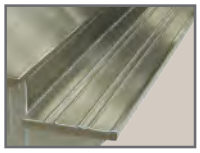
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Solid Tray Slide



TA-900
ADJ. Height Tables



TA-116
Adj. Mid-Shelf

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____	TA-130	Cutlery Dispenser Holder (Undercounter Mounted)
____	TA-135	Plate Shelf (Undercounter Mounted)
____	TA-205	Connect Cafeteria Items (Per Joint Between 2 Tables. Requires Casters)
____	TA-900	Upgrade Table To be Height Adjustable In Field (Up to 6" Only. Unit Ships Set Up)

ELECTRICAL & DATA PORT OUTLETS



TA-62
Duplex Outlet



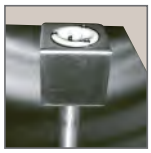
TA-62A
GFI Duplex Outlet



TA-62D
GFI Doghouse Outlet



TA-62F
Empty Junction Box



TA-112
Hubble Outlet

QTY.		
____	TA-62	Standard Duplex Electrical Outlet & Cover Plate (Under Flat Top). NEMA 5-15R
____	TA-62A	GFI Duplex Outlet & Cover Plate in a VKS Splash. NEMA 5-20R
____	TA-62C	GFI Duplex Outlet & Cover Plate Below Shelf Top. NEMA 5-20R
____	TA-62D	GFI Duplex Outlet & Cover Plate in a Doghouse. NEMA 5-20R

QTY.		
____	TA-62E	Upgrade Outlet to a NEMA 6-20R or Equiv.
____	TA-62F	Junction Box (empty) Below Table Top. Includes 1 Gang Size, Stainless Steel Face Plate
____	TA-112	Hubble Outlet
____	TA-622	CAT-5 Data Port Outlet. Cable Not Included

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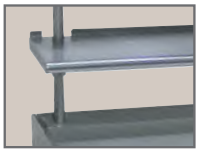
For Orders & Customer Service:
Email: customer@advancetabco.com or **Fax:** 631-242-6900

For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

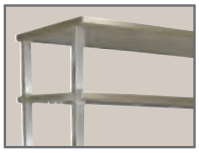
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TABLE MODIFICATIONS & ACCESSORIES

OVERSHELF & POT RACK MODIFICATIONS



TA-9A
1"Turn Up



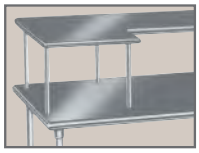
TA-22A
Square Edge



TA-71
Heat Lamp Mounting Provision



TA-100A
Bull Nose



TA-102
24" x 24" Extension

QTY.		
____	TA-9A	Partial 1" Turn-Up for all Table Mt. Shelves
____	TA-22A	Square Edge on Overshelf
____	TA-26-10	Welded Wall Shelf Brackets for 10" Wide Shelf
____	TA-26-12	Welded Wall Shelf Brackets for 12" Wide Shelf
____	TA-26-15	Welded Wall Shelf Brackets for 15" Wide Shelf
____	TA-26-18	Welded Wall Shelf Brackets for 18" Wide Shelf
____	TA-47	Shelf Mounting Bracket for Existing Table
____	TA-49	Wall Shelf 2" Offset
____	TA-60	Special Sizing Charge for Shelves (Must Order Larger Unit to be Cut Down to Smaller Size)
____	TA-71	Heat Lamp Mounting Provision
____	TA-71A	Heat Lamp Remote Control Bracket
____	TA-78	Additional Lin. Ft. Past 12' For Table Mt. Shelf (For ODS, OTS, TS, DS & WS Shelving only)
____	TA-77	Check Minder Shelf Provision (Factory install only)
____	TA-83	Spice Bins

QTY.		
____	TA-84A	Knife Rack for Rolled Rim Tables
____	TA-84B	Knife Rack for Poly Top Tables
____	TA-84C	Knife Rack for Square Edge Tables
____	TA-86	Stainless Steel Pot Hooks
____	TA-89	Double Sided Plated Pot Hooks (Package of 4)
____	TA-89A	Single Sided Plated Pot Hooks (Package of 4)
____	TA-98	Stainless Steel Flat Bar in lieu of Chain
____	TA-99	16 Ga. S/S 304 Upgrade for Wall & Over Shelves
____	TA-100A	Bull Nose All Sides of Shelf
____	TA-100R	Bull Nose Three Sides of Shelf w/ Rear Turn Up
____	TA-102	24" x 24" Extension for Microwave or Computer Shelf (Add to OTS and ODS Shelves. See page 65)
____	TA-103	24" Wide PT Shelf (36" Min Length. Mid mount only. PT Series Shelf, See Pg. 73. Add to 18" Wide Shelf)
____	TA-104	Additional Length Over 12' (Add to 18" Shelf. (PA & CU Shelving Only. Max. Length is 14' as Single Piece)

UNDERSHELF MODIFICATIONS

QTY.		
____	TA-9	1-1/2" Turn-Up for Undershelves
____	TA-17	Upgrade Undershelf to a Marine Edge (Must add TA-23)
____	TA-48	12"x12" Cut-Out in Back Panel or Undershelf for Plumbing

QTY.		
____	TA-94	Upgrade 16 Ga. 304 S/S Undershelf
____	TA-94A	Upgrade 14 Ga. 304 S/S Undershelf
____	TA-366	Reinforced Understructure For Undershelves

SIZE MODIFICATIONS

QTY.		
____	TA-33	Special Working Height
____	TA-59	36" Wide Equipment Stand
____	TA-6	Extra Length for Standard Tables Over 12' (Tables Over 14' Require Field Joint TA-57)
____	TA-61	Special Sizing Charge (Larger Unit Cut Down to Smaller Size)
____	TA-61A	Special Modification Charge

QTY.		
____	TA-65	Enclosed Base Units Over 12' (Open Base Table)
____	TA-66	Enclosed Base Units Over 12' (Sliding Door Units)
____	TA-67	Enclosed Base Units Over 12' (Hinged Door Units)
____	TA-105	Modify Enclosed Base Table w/ Drawers to 24" Width
____	TA-110	Modify Enclosed Base Table w/ Drawers to 36" Width

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For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

11 40 01-445

TABLE MODIFICATIONS & ACCESSORIES

LEG MODIFICATIONS

QTY.		
____	TA-16	1 Galvanized Leg with Plastic Bullet Foot (34 1/2" Total Length)
____	TA-16-4	4 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-16-6	6 Galvanized Legs with Plastic Bullet Feet (34 1/2" Total Length)
____	TA-19	Stainless Steel Flanged Bullet Foot For Work Table
____	TA-19L	S/S Bolt-on Leg w/ Flanged Foot For Enclosed Base Table
____	TA-20	1 Stainless Steel Leg with S/S Bullet Foot (34 1/2" Total Length)
____	TA-20-4	4 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)

QTY.		
____	TA-20-6	6 Stainless Steel Leg with S/S Bullet Feet (34 1/2" Total Length)
____	TA-20L	Replacement Bolt-on Leg For Enclosed Base Table
____	TA-21	Stainless Steel Bullet Foot
____	TA-68	Relocate Rear Cross Rail To Center (for Open Base Tables Only)
____	TA-72	Leg to Wall Brace (Set per table)
____	TA-95	Upgrade 16 Ga. 304 S/S Legs Only

WORK TABLE CASTERS



Standard Casters

Maintains the Standard 35-1/2" Working Height

200 lbs. Load Capacity Per Caster

When Used w/ Stainless Steel Legs

TA-25S-4 **Set of 4** (Two with Brakes)
TA-25S-6 **Set of 6** (Two with Brakes)

When Used w/ Galvanized Legs

TA-25G-4 **Set of 4** (Two with Brakes)
TA-25G-6 **Set of 6** (Two with Brakes)

Replacement Casters

For Work Tables

TA-25 **Set of 4** (Two with Brakes)

TA-25A **Set of 6** (Two with Brakes)

200 lbs. Load Capacity Per Caster



Optional Standard Caster Upgrades:

TA-25B Set For brakes on all wheels (Standard Casters) - Add price to the following models: TA-25, TA-25A, TA-25S-4, TA-25S-6, TA-25G-4, TA-25G-6

TA-25C Per Caster Upgrade Standard Caster with Heavy Duty Urethane Wheels (Per Caster)

EQUIPMENT STAND CASTERS



Standard Casters

5" Urethane Wheels.
Maintains the Standard 24" Working Height

200 lbs. Load Capacity Per Caster

w/ Stainless Steel Legs

TA-25ES **Set of 4** (Two with Brakes)

w/ Galvanized Legs

TA-25EG **Set of 4** (Two with Brakes)



HEAVY DUTY Casters

5" Urethane Wheels

400 lbs. Load Capacity Per Caster

TA-255 Super Heavy Duty Set of 4 (Two with Brakes)

TA-256 Super Heavy Duty Set of 6 (Two with Brakes)

Enclosed Base Table Casters

Easy Bolt-On Style



TA-255P **Set of 4** (Two with Brakes)
TA-255AP **Set of 6** (Two with Brakes)

300 lbs. Load Capacity Per Caster

For brakes on all wheels (Enclosed Base Casters) - Add price to models: TA-255P or TA-255AP

TA-255PB

Optional Equipment Stand Caster Upgrade:

TA-255B For brakes on all wheels (Equipment Casters) - Add price to any of the following models: TA-255, TA-256, TA-25ES, TA-25EG

Contact Our SMART FABRICATION™ Department for more information at 800-645-3166 or email in your specifications to smartfab@advancetabco.com

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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Submittal Sheet

09/15/2026

ITEM# 2.66 - COFFEE MACHINE (EXISTING/RELOCATED) (1 REQ'D)

Custom (EXISTING/RELOCATED)

EXISTING/TO BE RELOCATED

11 40 01-447

Description: COFFEE MACHINE (EXISTING/RELOCATED)

Notes: EXISTING/TO BE RELOCATED

Submittal Sheet

09/15/2026

ITEM# 2.66A - WATER FILTRATION SYSTEM, FOR COFFEE BREWERS (1 EA REQ'D)

Everpure QC7I SINGLE 4FC5-S

QC7I Water Filtration System, QC7I Single 4FC5-S, (1) 4FC5-S Fibredyne® carbon block cartridge, reduces sediment, chlorine, taste & odor, inhibits scale, 15,000 gallons capacity, 2.5 gpm flow rate, 5 micron, inlet water shut-off valve, outlet pressure gauge, flush valve, 3/8" inlet/outlet connections, NSF 42, (EV920261)

PENTAIR
EVERPURE

QC7I SINGLE 4FC5-S

System Part Number: EV9202-61



SYSTEM DESCRIPTION

The **QC7I Single 4FC5-S** water filtration system features exclusive Fibredyne™ II bacteriostatic media that filters sediment down to 5 microns and provides chlorine taste & odor reduction at a flow rate of 2.5 gpm for 15,000 gallons. The 5 micron mechanical filtration supports lasting, balanced performance with high turbidity water supplies. Integrated scale inhibitor media helps protect against the formation of scale* on equipment surfaces. This system is certified under NSF/ANSI Standard 42.

APPLICATIONS

- Ice machines
- Coffee brewers

FEATURES • BENEFITS

- Integrated scale inhibitor minimizes the potential for scale formation* to ensure reliable, efficient equipment operation
- Proprietary Fibredyne II media reduces chlorine taste & odor while providing particulate reduction down to 5 microns
- Fibredyne II media inhibits the growth of bacteria within the filter to guard against media fouling and optimize performance
- Inlet shutoff valve, flush valve, and pressure gauges simplify service and monitor operating performance
- Quick-change (QC) cartridges make changing cartridges simple and sanitary
- Reduces a range of contaminants to help ensure clearer, fresher water for consistently great-tasting beverages
- Helps protect equipment to help ensure reliable and efficient operation resulting in reduced maintenance and downtime
- NSF/ANSI Standard 42 certified for Bacteriostatic Effects and the reduction of Chlorine Taste & Odor, and Particulate Class III

INSTALLATION TIPS

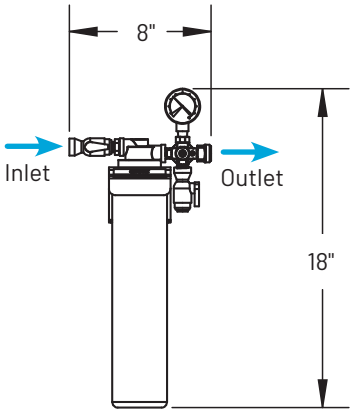
- Choose a mounting location suitable to support the weight of the system while operating.
- Install vertically and allow 2½" (6.35 cm) clearance below the cartridge for easy removal and replacement.
- Feed water temperature must not exceed 100°F (38°C).
- Do not install where the system could be exposed to freezing temperatures.
- Feed water supply pressure must not exceed 125 psi (non-shock). When pressure exceeds 85 psi, a pressure reducing valve is recommended.
- Flush cartridges by running water through the system for five (5) minutes.
- For more details, see the installation, operation, and maintenance guide included with the system.

*As tested by Pentair.
EPA Est. 002623-IL-002

11 40 01-450

QC7I SINGLE 4FC5-S

EV9202-61



SPECIFICATIONS

System	Performance
Overall Dimensions 18" H x 8" W x 5.25" D (45.7 cm x 20.4 cm x 13.4 cm)	**Service Flow Rate** 2.5 gpm (9.46 lpm)
Connections Inlet Connection: 3/8" FNPT Outlet Connection: 3/8" FNPT	**Rated Capacity** 15,000 gallons (56,781 L)
Operating Pressure 10 – 125 psi (0.7 – 8.6 bar)	**Chlorine Taste & Odor Reduction** Yes
Water Temperature 35 – 100°F (2 – 38°C)	**Particulate Reduction** Yes
Operating Weight 8 lbs (3.7 kgs)	**Bacteriostatic Effects** Yes
Shipping Weight 5 lbs (2.3 kgs)	
Electrical Connection None required	

REPLACEMENT CARTRIDGE(S)

Model	Qty	Description	Part No
4FC5-S	1	Primary filter	EV9693-31

For Pentair Everpure Product Warranties visit:
http://pentair.com/assets/foodservice-warranty

It is recommended that filter cartridges be replaced every six (6) months on a regular scheduled program, or when capacity is reached or if water pressure or flow to equipment becomes inadequate.

Always replace filter cartridges at least once per year.

The contaminants or other substances removed or reduced by this drinking water system are not necessarily in your water. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.

Since the conditions under which our products may be used are beyond our control, we cannot accept any liability with respect to the improper installation, application and/or use of our products.

System Tested and Certified by NSF International against NSF/ ANSI Standard 42 for the reduction of:

STANDARD NO. 42 – AESTHETIC EFFECTS

Bacteriostatic Effects

Chemical Reduction
Taste & Odor
Chlorine

Mechanical Filtration
Nominal Particulate Class III

PENTAIR

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Australia | 1-21 Monash Drive | Dandenong South, Vic 3175 | Australia | 011.1300 576 190 Tel | au.everpure@pentair.com
China | 21F Cloud 9 Plaza, NO 1118 | Shanghai, 200052 | China | 86.21.3211.4588 Tel | china.water@pentair.com
India | Boulevard, B-9/A, 7th Floor - Tower B Sector 62 | Noida - 201301 | 91.120.419.9444 Tel | indiacustomer@pentair.com
Europe | Pentair Water Belgium BVBA | Industriepark Wolfstee, Toekomstlaan 30, B-2200 Herentals | Belgium | +32.(0).14.283.504 Tel | sales@everpure-europe.com
Japan | Japan Inc. | Hashimoto MN Bldg. 7F, | 3-25-1 Hashimoto, Midori-ku, Sagamihara-shi | Kanagawa 252-0143 | Japan | 81.(0)42.775.3011 Tel | info@everpure.co.jp
Southeast Asia | 390 Havelock Road, | #04-01 King's Centre | Singapore 169662 | 65.6768.5800 Tel | cseverpure@pentair.com

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Submittal Sheet

09/15/2026

ITEM# 2.67 - SODA MACHINE (EXISTING/RELOCATED) (1 REQ'D)

Custom (EXISTING/RELOCATED)

EXISTING/TO BE RELOCATED

11 40 01-452

Description: SODA MACHINE (EXISTING/RELOCATED)

Notes: EXISTING/TO BE RELOCATED

Submittal Sheet

09/15/2026

ITEM# 2.67A - WATER FILTRATION SYSTEM, FOR FOUNTAIN / BEVERAGE MACHINES (1 EA REQ'D)

Everpure EV976111

QC7I Single-XCLM Fountain Filtration System, 5 micron, 1-2 gpm flow rate, rated capacity 9,300 to 19,300 gallons, chloramines reduction, NSF 42 (EV976111)

EVERPURE® QC7I SINGLE-XCLM+ HIGH CAPACITY CHLORAMINES REDUCTION SYSTEM

HIGH CAPACITY QUICK-CHANGE CHLORAMINES REDUCTION SYSTEM FOR FOUNTAIN APPLICATIONS

QC7I Single-XCLM+ System: EV9761-11
Replacement cartridge: EV9761-00



APPLICATIONS

Fountain

FEATURES • BENEFITS

A specialized carbon formulation maximizes the volume of activated carbon to provide a combination of optimal chloramines reduction with improved product life in a single cartridge

Reduces chloramines, chlorine taste & odor and other offensive contaminants that can adversely affect the taste of beverages

Superior filtration provides enhanced chlorine taste & odor reduction and filters dirt and particles as small as 5 microns in size

NSF/ANSI Standard 42 certified

INSTALLATION TIPS

Install vertically on flat surface with cartridge hanging down

Allow 2½" (6.35 cm) clearance below the cartridge for easy cartridge replacement.

Flush cartridge by running water through filter according to cartridge instructions.

Refer to Installation and Operation Guide for cartridge flushing and start-up.

OPERATION TIPS

Change cartridges on a regular one (1) year preventative maintenance program.

Change cartridges when capacity is reached or when pressure decreases.

SIZING

Rated Capacity at Service Flow Rate:

9,300 gallons @ 2.00 gpm
(35,024 L @ 7.57 Lpm)

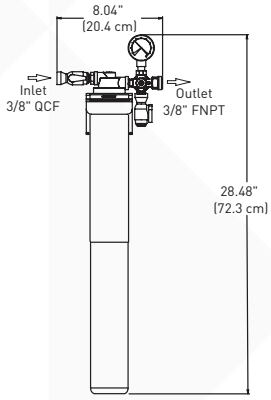
11,600 gallons @ 1.67 gpm*
(43,910 L @ 6.43 Lpm*)

19,300 gallons @ 1.00 gpm*
(73,058 L @ 3.78 Lpm*)

* Not Performance Tested or Certified by NSF.

EVERPURE® QC7I SINGLE-XCLM+ HIGH CAPACITY CHLORAMINES REDUCTION SYSTEM

EV9761-11



SPECIFICATIONS

Overall Dimensions
8.04" W x 5.3" D x 28.48" H
(20.4 cm x 13.5 cm x 72.3 cm)

Rated Capacity
9,300 gallons @ 2.00 gpm
(35,024 L @ 7.57 Lpm)

11,600 gallons @ 1.67 gpm*
(43,910 L @ 6.43 Lpm*)

19,300 gallons @ 1.00 gpm*
(73,058 L @ 3.78 Lpm*)

* Not Performance Tested or Certified by NSF.

Pressure Requirements
10 - 125 psi (0.7 – 8.6 bar), non-shock

Temperature
35 - 100°F (2 - 38°C)

Electrical Connection
None required

System is Tested and Certified by NSF International against NSF/ANSI Standard 42 for the reduction of:

STANDARD NO. 42 —
AESTHETIC EFFECTS

Chemical Reduction
Taste and Odor
Chloramines
Chlorine

Mechanical Filtration
Nominal Particulate Reduction:
Class III

The contaminants or other substances removed or reduced by this drinking water system are not necessarily in your water. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

WARRANTY

Everpure water treatment systems by Pentair® (excluding replaceable elements) are covered by a limited warranty against defects in material and workmanship for a period of five years after date of purchase. Everpure replaceable elements (filter cartridges and water treatment cartridges) are covered by a limited warranty against defects in material and workmanship for a period of one year after date of purchase. See printed warranty for details. Pentair will provide a copy of the warranty upon request.

PENTAIR

WATER QUALITY SYSTEMS

EVERPURE-SHURFLO WORLD HEADQUARTERS, 1040 MUIRFIELD DRIVE, HANOVER PARK, IL 60133 USA • FOODSERVICE.PENTAIR.COM
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011.1300 576 190 TEL • 011.61.39.562.7237 FAX • AU.EVERPURE@PENTAIR.COM EMAIL

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11 40 01-456

Submittal Sheet

09/15/2026

ITEM# 2.68 - MOP HOLDER (1 EA REQ'D)

Advance Tabco K-242

Mop Hanger, 23", accommodates (3)

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL 11 40 01-457

FABRICATED FLOOR MOP SINKS

Item #: _____ Qty #: _____
Model #: _____
Project #: _____



Standard Mop Sink
9-OP-20 Shown



Drop Front Mop Sink
9-OP-40DF Shown

FEATURES:

Floor mounted unit eliminates the need of lifting heavy containers.
Tile edge furnished on the rear.
Bowls rectangular in design for increased capacity.
K-16 3-1/2" Free Flow Drain. Connects to a 2" drain pipe.
-DF models feature a notched out front which allows for ease of emptying mop bucket).

CONSTRUCTION:

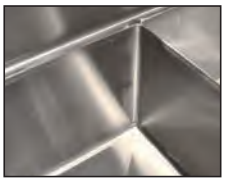
All TIG welded.
Welded areas blended to match adjacent surfaces and to a satin finish.

MATERIAL:

16 Gauge type "304" series stainless steel sink bowl & Apron.



Notched Out Front Allows Ease of Emptying Mop Bucket



Fabricated Bowls are Welded Together at the Seams

	Model #	Bowl Size (A x B x C)	O.A. Dimension (W x L x H)	Drain Distance (E)	Drain Distance (F)	Approx. Wt.	Approx. Cu.
STANDARD	9-OP-20	16" x 20" x 6"	21" x 25" x 10"	10-1/2"	12-1/2"	33 lbs.	4
	9-OP-28	20" x 28" x 6"	25" x 33" x 10"	12-1/2"	16-1/2"	47 lbs.	7
	9-OP-40	16" x 20" x 12"	21" x 25" x 16"	10-1/2"	12-1/2"	45 lbs.	6
	9-OP-48	20" x 28" x 12"	25" x 33" x 16"	12-1/2"	16-1/2"	62 lbs.	9
LARGE BOWL	9-OP-44	24" x 24" x 12"	29" x 29" x 16"	14-1/2"	14-1/2"	70 lbs.	9
DROP FRONT	9-OP-40DF	16" x 20" x 12"	18-1/2" x 25" x 16"	10-1/2"	12-1/2"	85 lbs.	9
	9-OP-48DF	20" x 28" x 12"	22-1/2" x 33" x 16"	12-1/2"	16-1/2"	110 lbs.	15

MOP SINK ACCESSORIES

16" High Side & Back Splashes for 9-OP Series Mop Sinks

Splashes on All 3 Sides

Model #	Fits Units:	Model #	Fits Units:
K-298	9-OP-20 9-OP-40	K-298D	9-OP-40DF
K-299	9-OP-28 9-OP-48	K-299D	9-OP-48DF
K-300	9-OP-44	-	-

Splash on Left or Right & Back

Model #	Fits Units:	Model #	Fits Units:
K-288LorR	9-OP-20 9-OP-40	K-288LDorRD	9-OP-40DF
K-290LorR	9-OP-28 9-OP-48	K-290LDorRD	9-OP-48DF
K-291LorR	9-OP-44	-	-

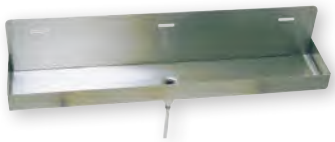
Height Above Finished Floor (A.F.F.)
9-OP-20/9-OP-28 = 26" High 9-OP-40/9-OP-40DF/9-OP-44/9-OP-48/ 9-OP-48DF = 32" High



Left & Right Splashes Shown

K-16 Replacement drain for floor mop sinks
K-240 Service Faucet*
K-242 23" wide mop hanger
K-243 Stainless steel mop drainage tray
K-244 Hose and hanger
K-245 8" x 24" utility shelf
K-246 8" x 36" utility shelf

*Does not meet Federal Lead Free Standards as it is not intended for potable water.



K-243



K-240



K-245



K-242



K-16



K-244

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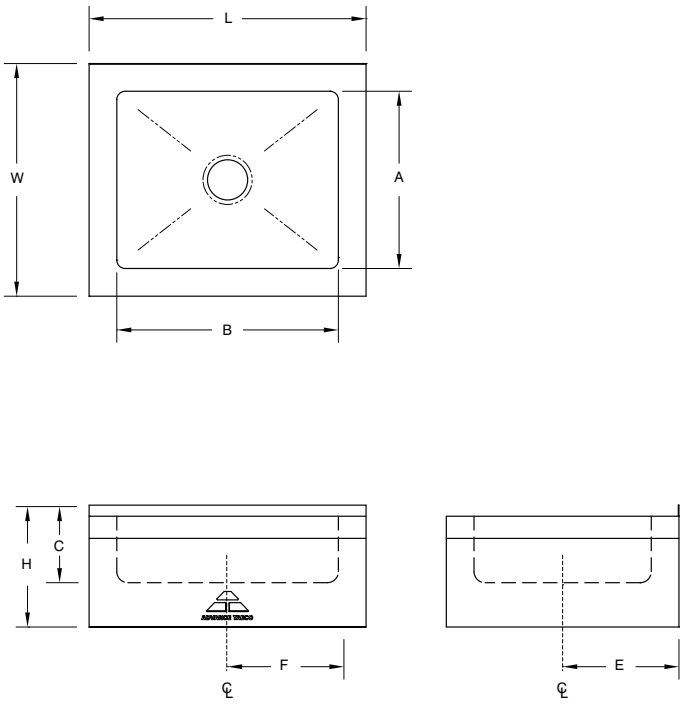
DIMENSIONS and SPECIFICATIONS

11 40 01-458

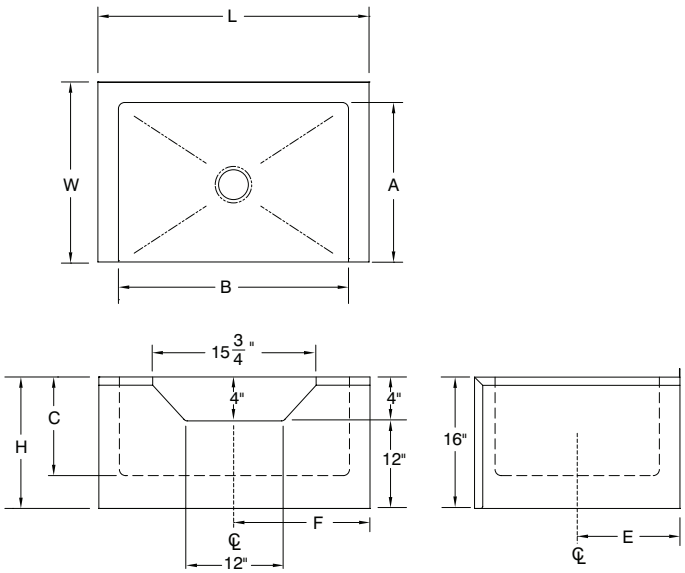
TOL Overall: ± .500”
Interior: ± .250”

ALL DIMENSIONS ARE TYPICAL

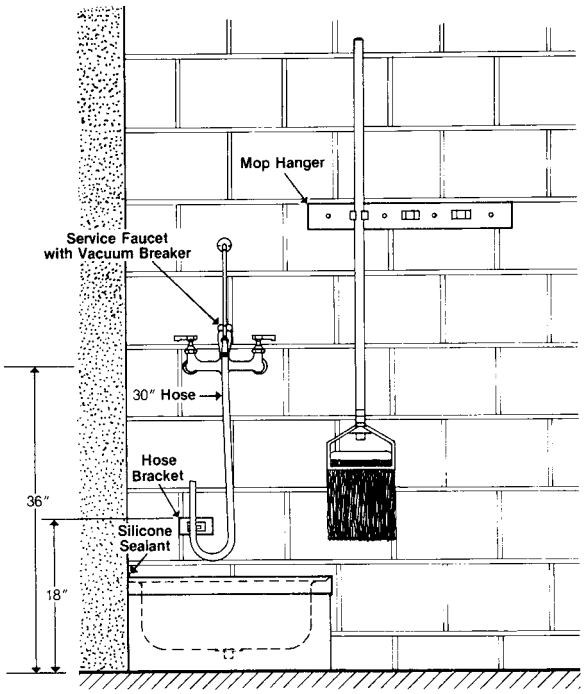
STANDARD MOP SINK



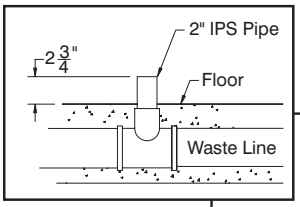
DROP FRONT MOP SINK

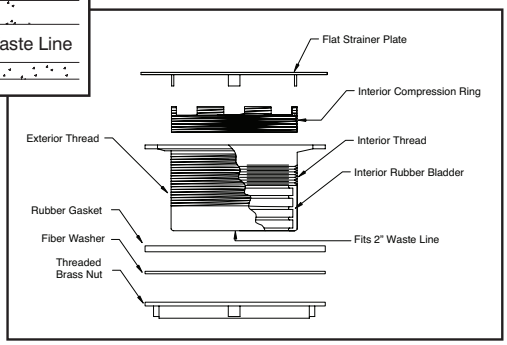


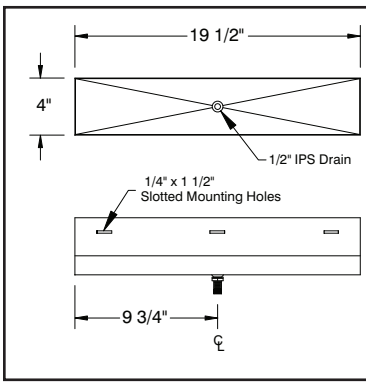
SUGGESTED INSTALLATION



MOP SINK DRAIN ASSEMBLY







K-243 MOP DRAINAGE TRAY
13 lbs.

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11 40 01-459

Submittal Sheet

09/15/2026

ITEM# 2.69 - MOP SINK (1 EA REQ'D)

Advance Tabco 9-OP-28

Mop Sink, floor mounted, 33"W x 25"D x 10"H (overall), 28"W x 20" front-to-back x 6" deep (bowl size), free flow drain with 2" IPS outlet, stainless steel construction, NSF

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STAINLESS STEEL 11 40 01-460

FABRICATED FLOOR MOP SINKS

Item #: _____ Qty #: _____
Model #: _____
Project #: _____



Standard Mop Sink
9-OP-20 Shown



Drop Front Mop Sink
9-OP-40DF Shown

FEATURES:

Floor mounted unit eliminates the need of lifting heavy containers.

Tile edge furnished on the rear.

Bowls rectangular in design for increased capacity.

K-16 Free Flow Drain is included with each mop sink.

DF models feature a notched out front which allows for ease of emptying mop bucket)

CONSTRUCTION:

All TIG welded.

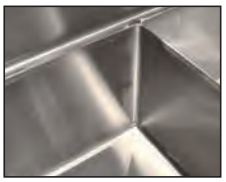
Welded areas blended to match adjacent surfaces and to a satin finish.

MATERIAL:

16 Gauge type "304" series stainless steel sink bowl & Apron.



Notched Out Front Allows Ease of Emptying Mop Bucket



Fabricated Bowls are Welded Together at the Seams

	Model #	Bowl Size (A x B x C)	O.A. Dimension (W x L x H)	Drain Distance (E)	Drain Distance (F)	Approx. Wt.	Approx. Cu.
STANDARD	9-OP-18	15" x 15" x 10"	18" x 18" x 14"	9"	9"	30 lbs.	4
	9-OP-20	16" x 20" x 6"	21" x 25" x 10"	10-1/2"	12-1/2"	33 lbs.	4
	9-OP-28	20" x 28" x 6"	25" x 33" x 10"	12-1/2"	16-1/2"	47 lbs.	7
	9-OP-21	21" x 21" x 10"	26" x 26" x 14"	13"	13"	65 lbs.	9
	9-OP-40	16" x 20" x 12"	21" x 25" x 16"	10-1/2"	12-1/2"	45 lbs.	6
	9-OP-48	20" x 28" x 12"	25" x 33" x 16"	12-1/2"	16-1/2"	62 lbs.	9
LARGE BOWL	9-OP-43	24" x 24" x 10"	29" x 29" x 14"	14-1/2"	14-1/2"	67 lbs.	9
	9-OP-44	24" x 24" x 12"	29" x 29" x 16"	14-1/2"	14-1/2"	70 lbs.	9
	9-OP-33	24" x 36" x 12"	29" x 41" x 16"	14-1/2"	20 1/2"	73 lbs.	12
	9-OP-34	24" x 48" x 12"	29" x 53" x 16"	14-1/2"	26 1/2"	76 lbs.	15
DROP FRONT	9-OP-40DF	16" x 20" x 12"	18-1/2" x 25" x 16"	10-1/2"	12-1/2"	85 lbs.	9
	9-OP-48DF	20" x 28" x 12"	22-1/2" x 33" x 16"	12-1/2"	16-1/2"	110 lbs.	15

SERVICE & MOP SINK ACCESSORIES & MODIFICATIONS

16" HIGH BACK & SIDE SPLASHES

(For 9-OP Series Mop Sinks)

- 16 Ga., 300 Stainless Steel
- Field Installation By Others



K-298 Shown

	Model #	Fits Units:	Height Above Finished Floor (A.F.F.)
SPLASH ON LEFT OR RIGHT & BACK	K-288L or R	9-OP-20	26"
		9-OP-40	32"
	K-288LD or RD	9-OP-40DF	32"
	K-290LorR	9-OP-28	26"
		9-OP-48	32"
	K-290LD or RD	9-OP-48DF	32"
	K-291L or R	9-OP-44	32"
	K-293L or R	9-OP-33	32"
	K-294L or R	9-OP-34	32"
	K-300C	9-OP-44	
SPLASHES ON ALL 3 SIDES	K-298	9-OP-20	26"
		9-OP-40	32"
	K-298D	9-OP-40CDF	32"
	K-299	9-OP-28	26"
		9-OP-48	32"
	K-299D	9-OP-48DF	32"
	K-300	9-OP-44	32"
	K-303	9-OP-33	32"
	K-304	9-OP-34	32"

Service Faucet For Mop Sinks



8" O.C.

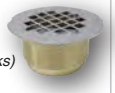
K-240*

**Does Not Meet Federal Lead Free Standards As It Is Not Intended For Potable Water.*



23" Wide Mop Hanger
K-242

Replacement Drain *(For Mop Sinks)*
K-16

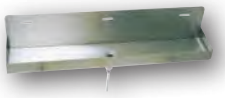




Hose & Hanger
K-244

S-Hook Mop Hanger
K-91





Wall Mounted Mop Drainage Tray
K-243

8" Wide Utility Shelf



L	MODEL	Approx Wt	Approx Cubes
24"	K-245	12 lbs.	1
36"	K-246	15 lbs.	2

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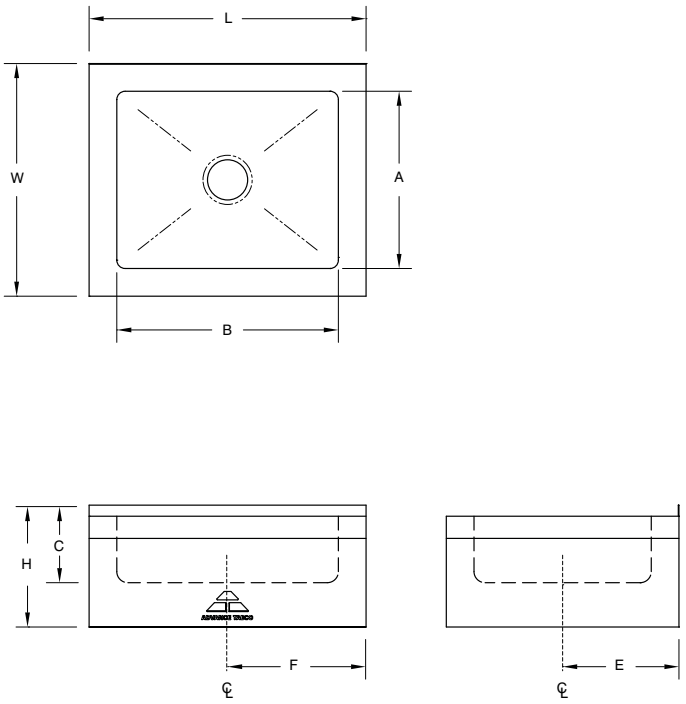
DIMENSIONS and SPECIFICATIONS

11 40 01-461

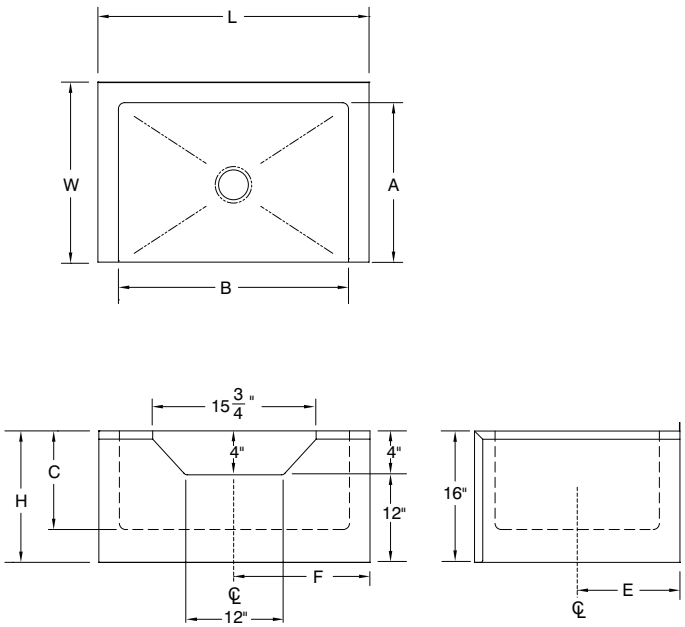
TOL Overall: ± .500”
Interior: ± .250”

ALL DIMENSIONS ARE TYPICAL

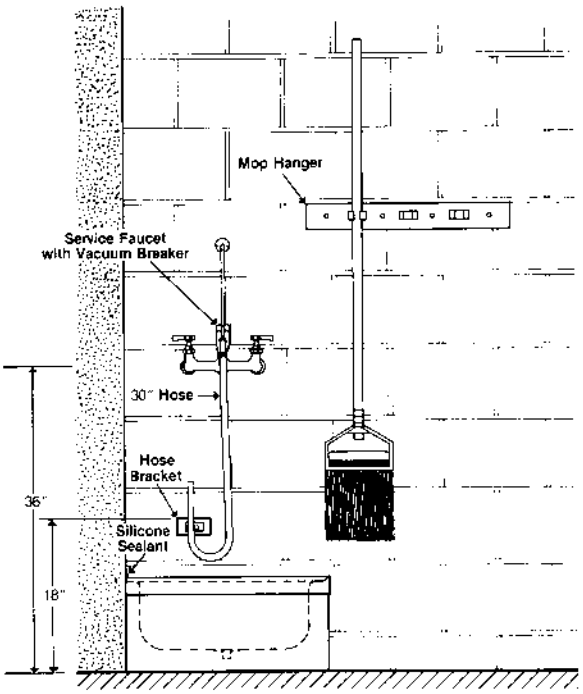
STANDARD MOP SINK



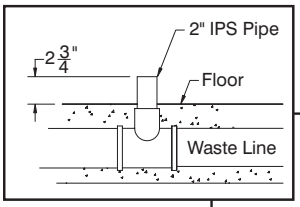
DROP FRONT MOP SINK

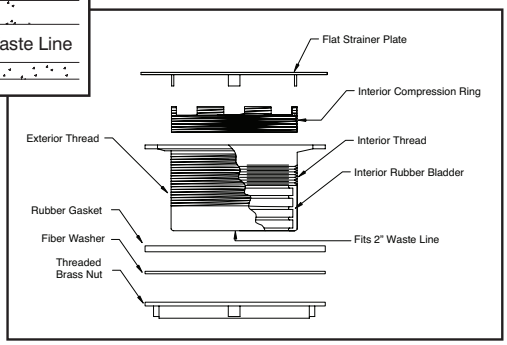


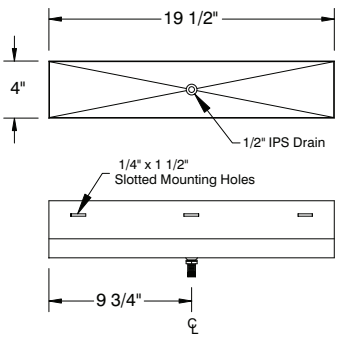
SUGGESTED INSTALLATION



MOP SINK DRAIN ASSEMBLY







K-243 MOP DRAINAGE TRAY
13 lbs.

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11 40 01-462

Submittal Sheet

09/15/2026

ITEM# 2.70 - MOP SINK FAUCET (1 EA REQ'D)

Advance Tabco K-240

Service Sink Faucet, wall mount, heavy duty, 8" OC, 6-1/2" spout, with hose thread & pail hook, vacuum breaker spout, wall braced, chrome-plated brass

K-240
SERVICE FAUCET FOR MOP SINKS

11 40 01-463



BACK VIEW
1/2" NPT FEMALE THREAD

Item #: _____ Qty #: _____
Model #: _____
Project #: _____

FEATURES:

8" O.C. water supply.
Quarter turn wedge style handles with colored hot & cold Indexes.
9.6 GPM/36.3 LPM.
Wall support bracket & pail hook.
Vacuum breaker. Built-in stops.
Garden hose outlet.

MATERIAL:

Brass chrome plated body & spout.
Chrome plated handles.



Click This Link To View Assembly Sheet

Options & Accessories

Replacement Vacuum Breaker Repair Kit For K-240



K-03

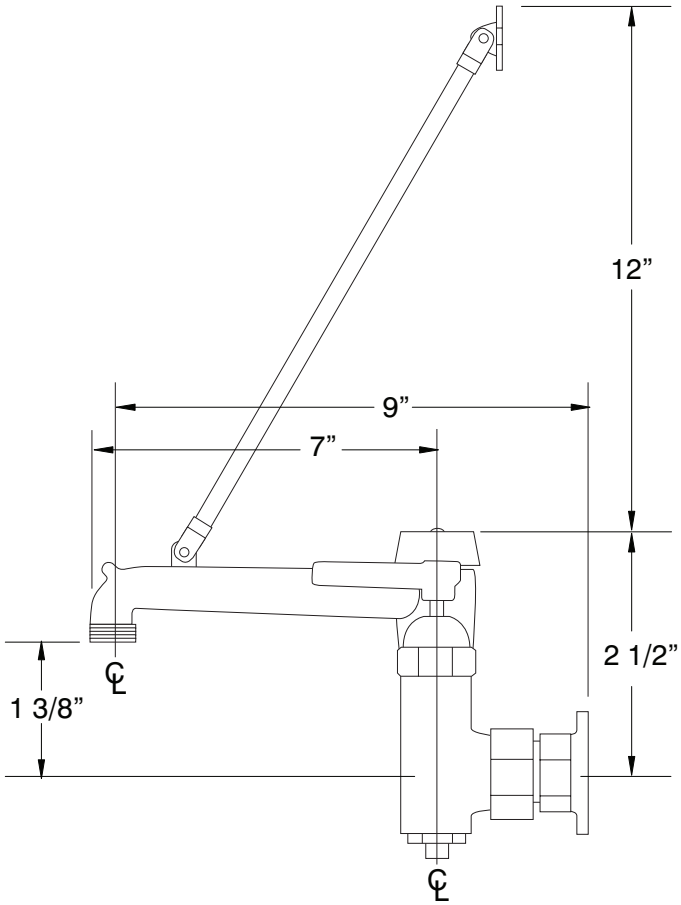
Faucet Repair Kit*
K-00B (Set of 2)
Includes 2 Cartridges and 2 Handles With Red & Blue Indexes



*Can Only Be Used On Faucets Purchased After January 2016. For Older Faucets, Consult Customer Service.

⚠ WARNING:
Faucet(s) on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

DIMENSIONS and SPECIFICATIONS



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REF-G

11 40 01-464

Submittal Sheet

09/15/2026

ITEM# 2.71 - CART, LAUNDRY (2 EA REQ'D)

Rubbermaid 1881749

Executive Collapsible Basket X-Cart, 4 bushel capacity (up to 220 lb. capacity), 24-1/10"L x 20-3/10"W x 34"H, detachable black vinyl bag, stainless steel powder-coated frame, (4) swivel casters with bumper guards

ACCESSORIES

Mfr	Qty	Model	Spec
Rubbermaid	2	ZZARUBBERPROP65	WARNING: This product can expose you to chemicals, which is known to the State of California to cause cancer and/or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Rubbermaid Commercial Products 1881749 Item #2.71

11 40 01-465

Description: Cart, Laundry

Notes: Executive Collapsible Basket X-Cart, 4 bushel capacity (up to 220 lb. capacity), 24-1/10"L x 20-3/10"W x 34"H, detachable black vinyl bag, stainless steel powder-coated frame, (4) swivel casters with bumper guards

11 40 01-466

Submittal Sheet

09/15/2026

ITEM# 2.72 - SHELVING, UNIT (1 EA REQ'D)

Metro METROMAXQ

ACCESSORIES

Mfr	Qty	Model	Spec
			Each unit to consist of four tiers of shelves, four posts four swivel casters, two with brakes
Metro	4	MQ2148G	Quick Ship - MetroMax® Q Shelf, 48"W x 21"D, removable open grid polymer shelf mats on an epoxy coated steel frame with quick adjust corner releases, (4) wedge connectors, Microban® antimicrobial product protection, 800 lb. capacity per shelf, NSF
Metro	4	MX63UP	Polymer trilobal post (compatible with MetroMax® i, MetroMax® 4, MetroMax® Q), 61-3/16"H, for use with stem casters, adjusts at 1" increments, corrosion proof all polymer construction with built in Microban® antimicrobial product protection
Metro	2	5MPXGSA	Stainless Steel Cart-Washable Stem Caster, swivel, flat polyurethane wheel tread, 300 lb. capacity. NSF listed(for use with all MetroMax posts & shelves)
Metro	2	5MPBXGSA	Stainless Steel Cart-Washable Stem Caster, brake, flat polyurethane wheel tread, 300 lb. capacity, NSF (for use with all MetroMax posts & shelves)
			Mount first shelf at 10” above the finished floor with remaining shelves spaced equally apart
			KEC to verify shelving size requirements with jobsite conditions

11 40 01-467

Item # _____

Job _____

We put space to work.

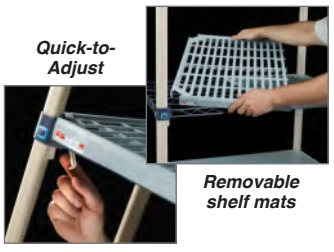
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning. Visit metro.com/service-support for cleaning guidelines.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

L02-178
Printed in U.S.A. 9/21

Information and specifications are subject to change without notice. Please confirm at time of order.

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Job _____

11.40.01.468

MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14fl (356mm)	18fl (457mm)	21fl (533mm)	24fl (610mm)
Maxium Post Height Allowable	▼	▼	▼	▼
Stationary	63fl (1600mm)	86fl (2184mm)	86fl (2184mm)	86fl (2438mm)
Mobile	54fl (1372mm)	74fl (1880mm)	74fl (1880mm)	86fl (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall. Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector: Reinforced nylon. Replacement MetroMax Q Wedges Cat. No. MQ9985 (Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

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We put space to work.

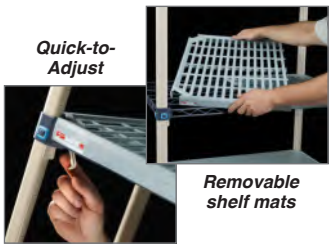
MetroMax Q® Polymer / Wire Shelving

Quick-to-adjust, corrosion resistant shelving constructed of removable polymer open grid shelf mats, wire shelf frames, and corner releases. Shelf frames and steel posts have an epoxy coating over an electroplated substrate. Shelves offer a 20 year warranty against rust and corrosion. Polymer posts are rust proof. Microban® antimicrobial product protection is built into the shelf mats and posts. Shelf has a rigid four-sided frame with center truss(es). Robust corner provides complete 360° capture of the wedge and post for added stability. Stationary units have maximum capacity of 2,000 lbs. (907kg) evenly distributed. Mobile units (with stem casters) offer a maximum total unit load of 900 lbs. (408kg). Units assemble easily — shelves mount on four one-piece wedges along grooved, numbered posts and adjust on 1" (25mm) increments.





- **Forever Strong:** Proven corner connection and four-sided shelf frame with center truss(es) assures stability and strength in stationary, mobile, and high-density track shelving configurations.
  800 lbs. (363kg) per shelf for lengths of 24" to 48" (610 to 1219mm)
  600 lbs. (272kg) per shelf for lengths of 54" (1372mm) or longer
  Stationary unit: 2000lbs (907kg) evenly distributed.
  Mobile unit (with stem casters): Up to 900lbs. (408kg).
  Multiply the caster load rating by 3 to determine actual rating.
- **Long life Rust Resistance:** Shelves offer a 20 year limited corrosion warranty and are combined with rust proof polymer posts.
- **Easy to Clean and Maintain:** Polymer mats can be easily removed and cleaned in a sink or commercial washer / dish machine.
- **Microban® Antimicrobial Product Protection** is built into the shelf mats and posts to inhibit the growth of bacteria, mold, mildew, and fungus that cause odors and product degradation. Microban product protection keeps the product "cleaner between cleanings".
- **Quick-to-Adjust:** Patented corner release allows shelves to be adjusted without tools. Simply flip each corner release, relocate the wedge connectors on the posts, and reposition the shelf. Quickly adjust shelves to reclaim wasted vertical space.
- **Efficient Use of Space:** Shelves adjust on 1" (25mm) increments along the post to maximize the use of available vertical space.
- **Fast, Easy Assembly:** Shelves are ready to use right out of the box. One-piece wedges securely attach to the posts. Raised beads on the back of each wedge snap into grooves on the post. Window on wedge aligns with numbers on the post to locate the desired shelf position. Shelf mounts on four wedges, A unit can be assembled without tools in minutes.
- **Interchangeable:** Part of the MetroMax platform, MetroMax Q shelves are compatible on the same shelving units with MetroMax i and MetroMax 4 shelves.
- **Open Grid and Solid Mat Options:** MetroMax Q is available with open grid mats. Open grid shelves promote air circulation and light penetration. If a solid shelf is required, MetroMax i or MetroMax 4 solid shelves may be added to the MetroMax Q unit.
- **NSF Listed** for all environments.
- **Optional Accessories** are on spec sheet 9.25.



Quick-to-Adjust

Removable shelf mats

Material Specifications:

- **Shelf Mats:** Injection-molded polypropylene with exclusive built-in Microban® antimicrobial product protection.
- **Shelf frames:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish.
- **Epoxy-coated posts:** Steel with electroplated substrate and highly durable, abrasion-resistant epoxy finish. Epoxy finish has built-in Microban antimicrobial product protection. The adjustable foot is reinforced nylon.
- **Temperature range:** -20°F (-29°C) to 125°F (52°C) continuous use, with intermittent exposure to 200°F (93°C) for cleaning.

*MICROBAN® and the MICROBAN® symbol are registered trademarks of the Microban® Products Company, Huntersville, NC. Microban® product protection does not by itself protect a user from food borne illness. Product must be routinely cleaned.

Supports good HACCP processes

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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Outside U.S. and Canada: www.metro.com/contactus

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Job _____

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MetroMax Q®
POLYMER / WIRE SHELVING

We put space to work.

Standard Interchangeable Shelves

Part number includes shelf with removable mats and one bag of wedges

Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats	Nominal Width/Length (in.)	(mm)	Cat. No. Shelf w/ grid Mats
14x24	355x610	MQ1424G	21x24	530x610	MQ2124G
14x30	355x760	MQ1430G	21x30	530x760	MQ2130G
14x36	355x914	MQ1436G	21x36	530x914	MQ2136G
14x42	355x1060	MQ1442G	21x42	530x1060	MQ2142G
14x48	355x1219	MQ1448G	21x48	530x1219	MQ2148G
-	-	-	21x54	530x1372	MQ2154G
14x60	355x1524	MQ1460G	21x60	530x1524	MQ2160G
14x72	355x1829	MQ1472G	21x60	530x1829	MQ2172G
18x24	457x610	MQ1824G	24x24	610x610	MQ2424G
18x30	457x760	MQ1830G	24x30	610x760	MQ2430G
18x36	457x914	MQ1836G	24x36	610x914	MQ2436G
18x42	457x1060	MQ1842G	24x42	610x1060	MQ2442G
18x48	457x1219	MQ1848G	24x48	610x1219	MQ2448G
18x54	457x1372	MQ1854G	24x54	610x1372	MQ2454G
18x60	457x1524	MQ1860G	24x60	610x1524	MQ2460G
18x72	457x1829	MQ1872G	24x60	610x1829	MQ2472G

Heavy-Duty Dunnage Shelves

- Weight capacity per shelf evenly distributed: 1,200 lbs. (544kg) on shelves up to and including 48" (1219mm) long; 900 lbs. (408kg) for shelves 54" (1370mm) and longer.
- Dunnage shelves must be used on shelving units with four posts.

Grid Mat Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MHP2436G	24	610	36	914	21	9.5
MHP2448G	24	610	48	1220	27	12.2
MHP2454G	24	610	54	1370	29	13.2
MHP2460G	24	610	60	1524	33	15.0

Shelving Height Guidelines – MetroMax

Shelf Depth	14" (356mm)	18" (457mm)	21" (533mm)	24" (610mm)
Maximum Post Height Allowable	▼	▼	▼	▼
Stationary	63" (1600mm)	86" (2184mm)	86" (2184mm)	86" (2184mm)
Mobile	54" (1372mm)	74" (1880mm)	74" (1880mm)	86" (2184mm)

Note: 14" deep stationary shelving taller than 63" must be properly fastened to floor or the wall.
Reference spec sheet 9.25, page 2 for options.

Rust Proof Polymer Posts - Lifetime warranty against rust.

Stationary - with leveling foot

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13P	0.5	0.2	13	370	14 3/16	360
MX27P	0.9	0.4	27	685	28 3/16	716
MX33P	1.0	0.5	33	875	34 3/16	868
MX54P	1.6	0.7	54	1370	54 3/16	1376
MX63P	1.8	0.8	63	1585	62 3/16	1580
MX74P	2.3	1.0	74	1690	74 3/16	1884
MX86P	2.5	1.4	86	2195	86 3/16	2189

Mobile - for stem casters

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MX13UP	0.5	0.2	13	370	14 3/16	360
MX27PE	2.0	0.9	27	685	28 3/16	716
MX33UP	1.0	0.5	33	875	34 3/16	868
MX54UP	1.6	0.7	54	1370	54 3/16	1376
MX63UP	1.8	0.8	63	1585	62 3/16	1580
MX70UP	2.0	0.9	70	1778	69 3/16	1757
MX74UP	2.3	1.0	74	1690	74 3/16	1884
MX86UP	3.0	1.4	86	2195	86 3/16	2189

Polymer post

Stationary Mobile



Shelf Wedge Connector:
Reinforced nylon.
Replacement MetroMax Q Wedges
Cat. No. MQ9985
(Bag of 4)

Epoxy Coated Steel Posts - For heavy-duty mobile applications. 15 year limited rust warranty.

Stationary - with leveling foot

Polymer Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13PE	1.0	0.5	13	370	14 3/16	360
MQ27PE	2.0	0.9	27	685	28 3/16	716
MQ33PE	2.5	1.1	33	875	34 3/16	868
MQ54PE	4.0	1.8	54	1370	54 3/16	1376
MQ63PE	4.5	2.0	63	1585	62 3/16	1580
MQ74PE	5.5	2.5	74	1690	74 3/16	1884
MQ86PE	6.5	2.9	86	2195	86 3/16	2189

Mobile - for stem casters

Epoxy-Coated Steel Model No.	Approx. Pkd. Wt. (lbs.)	(kg)	Nominal Height (in.)	(mm)	Actual Height (in.)	(mm)
MQ13UPE	1.0	0.5	13	370	14 3/16	360
MQ27UPE	2.0	0.9	27	685	28 3/16	716
MQ33UPE	2.5	1.1	33	875	34 3/16	868
MQ54UPE	4.0	1.8	54	1370	54 3/16	1376
MQ63UPE	4.5	2.0	63	1585	62 3/16	1580
MQ70UPE	2.0	0.9	70	1778	69 3/16	1757
MQ74UPE	5.5	2.5	74	1690	74 3/16	1884
MQ86UPE	6.5	2.9	86	2195	86 3/16	2189

Epoxy-coated steel post

Stationary Mobile



x4



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Item # _____

Job _____

MetroMax® Accessories

MetroMax Storage System consists of interchangeable corrosion proof MetroMax i, corrosion proof MetroMax 4, and corrosion resistant MetroMax Q shelves and posts. Note the category (i, 4, Q) above the part number column for compatibility. Accessories listed in this specification sheet are NSF listed unless noted otherwise.

2" (51mm) Stackable Shelf Ledges

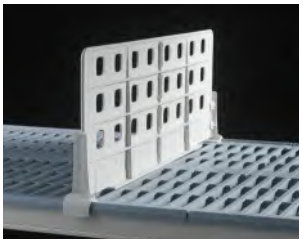
- Prevent items from falling off shelves.
- Snap on and off quickly. Easily stacked to contain larger items
- Corrosion proof: Polymer (High-Density Polypropylene) and Type 304 stainless steel.
- Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Type	Nominal Length (in.)	(mm)
MXLS18-2S	MAX4-LS18-2S	MQLS18-2S	Side	18	457
—	MAX4-LS21-2S	MQLS21-2S	Side	21	530
MXLS24-2S	MAX4-LS24-2S	MQLS24-2S	Side	24	610
MXL24-2S	MAX4-L24-2S	MQL24-2S	Back	24	610
MXL30-2S	MAX4-L30-2S	MQL30-2S	Back	30	760
MXL36-2S	MAX4-L36-2S	MQL36-2S	Back	36	914
MXL42-2S	MAX4-L42-2S	MQL42-2S	Back	42	1066
MXL48-2S	MAX4-L48-2S	MQL48-2S	Back	48	1219
MXL54-2S	MAX4-L54-2S	MQL54-2S	Back	54	1370
MXL60-2S	MAX4-L60-2S	MQL60-2S	Back	60	1524
MXL72-2S	—	MQL72-2S	Back	72	1829

8" (203mm) Shelf Dividers — standard duty

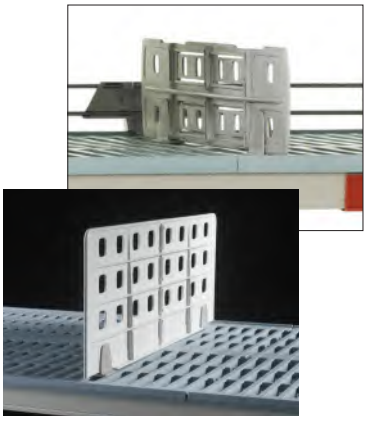
- Use to create organized compartments or to simply separate shelf contents.
- Easily repositioned on grid and solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).
- Three-piece design — Ships assembled.



i Ledge Model No.	4 Ledge Model No.	Q Ledge Model No.	Nominal Length (in.)	(mm)
MXD18-8	MAX4-D18-8	MQD18-8	18	457
MXD24-8	MAX4-D24-8	MQD24-8	24	610

Universal Shelf Dividers — light duty, for open grid shelves

- Maximum flexibility: Can be repositioned along the entire shelf.
- Easiest divider to install.
- Three-piece design; clips connect to any open grid or wire shelf; divider panel then drops into place. Does not attach to solid shelves.
- Corrosion proof: Polymer (High-Density Polypropylene).



i, 4, Q Model No.	Fits Shelf Depth	Nominal Height (in.)	(mm)	Nominal Length (in.)	(mm)	Sold as
MUD18-8	18", 21" (457,530mm)	8	203	18	457	Each
MUD24-8	24" (610mm)	8	203	24	610	Each
MUD24H4-4PK	24" (610mm)	4	102	24	610	4 Pack

All Metro Catalog Sheets are available on our website: **www.metro.com**

InterMetro Industries Corporation
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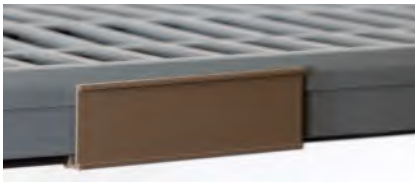
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MetroMax® Accessories



MetroMax i Label Holder



MetroMax Q Label Holder



MetroMax 4 Label Holder

MetroMax i Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

i Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
9989PX	1 x 4 1/2	25.4 x 114	All		.03	.01
9989X1	1 x 11 9/32	25.4 x 285	24	610	.14	.06
9989X3	1 x 23 9/32	25.4 x 590	36	914	.30	.13
9989X5	1 x 35 9/32	25.4 x 895	48	1219	.40	.18

MetroMax Q Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1¼" (32mm).

Q Label Holder Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MQ04LH	4	102	All		.03	.01
MQ24LH	15 7/16	392	24	610	.14	.06
MQ36LH	27 7/16	697	36	914	.30	.13
MQ48LH	39 7/16	1002	48	1219	.40	.18
MQ60LH	51 7/16	1307	60	1524	.50	.22
MQ72LH	63 7/16	1611	72	1825	.60	.27

MetroMax 4 Label Holder

- Designed to accept label cards or adhesive labels. Slot measures approximately 1" (25mm).

4 Model No.	Actual Length (in.)	Actual Length (mm)	Fits Shelf (in.)	Fits Shelf (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MAX4-9989PX	4	102	All		.03	.01

Color Shelf Markers

- Attach easily to shelf for content identification.
- Available in seven standard colors.
- i and Q versions available.



i Model No.	4 Model No.	Q Model No.	Shelf Marker Color	Length (in.)	Length (mm)
CSM6-BX		CSM6-BQ	Blue	6	152
CSM6-GX		CSM6-GQ	Green	6	152
CSM6-RX		CSM6-RQ	Red	6	152
CSM6-TX		CSM6-TQ	Tan	6	152
CSM6-WX		CSM6-WQ	White	6	152
CSM6-YX		CSM6-YQ	Yellow	6	152
CSM6-GRX		CSM6-GRQ	Gray	6	152



MetroMax i with direct mount supports

Wall Mount Shelving

- MetroMax i shelf can be mounted to Metro shelf supports using the MetroMax i corner adapter kit.
  Model No. **M9997-4** Bag of four adapters.
- MetroMax 4 shelf can be mounted to Metro shelf supports using the MetroMax 4 corner adapter kit.
  Model No. **MAX4-9997-4** Bag of four adapters.
- MetroMax Q shelf mounts to Metro shelf supports without the need for adapters.

NOTE: All MetroMax platform shelves can be used with direct mount or post type shelf supports (reference spec sheet 10.40) or SmartWall shelf support (reference spec sheet 10.42).



x4

M9997-4



x4

MAX4-9997-4



Post Clamp

Adds stability by joining posts of two separate units together. With it, each unit is supported by four posts and buttressed by the adjacent unit. Stainless Steel.
Model No. 9994X



Foot Plate

Used to add stability to the shelving unit or to bolt units to the floor.
Model No.
Zinc: 9993Z
Stainless Steel: 9993S



Wall Clamp

Used to anchor a MetroMax Q shelving unit to the wall. Plated finish.
Model No. 9984C

Note: Foot plates (fastened to the floor) or wall clamps (fastened to the wall) must be used with 14" (357mm) deep stationary MetroMax Q units taller than 63" (1600mm).

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MetroMax® Accessories

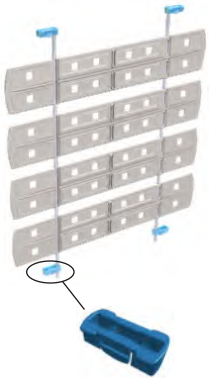
Shelf-to-Shelf Dividers

- Create full height compartments to fully organize the storage cube between two shelves.
- Can be used as a side ledge or interior divider.
- Compatible with any MetroMax i, MetroMax 4 or MetroMax Q open grid shelf or Metro wire shelf.
- Consists of a divider assembly and (4) mounting clips.

  Divider assembly: high-density polypropylene 4" (102mm) panels and stainless steel rods.

  Mounting clips: high-density polyethylene (HDPE)

i, 4 and Q Model No.	Fits Shelf Depth (in.)	(mm)	Nominal Length (in.)	(mm)
MD18-16	18, 21	457, 530	16	406
MD18-20	18, 21	457, 530	20	508
MD18-24	18, 21	457, 530	24	610
MD24-16	24	610	16	406
MD24-20	24	610	20	508
MD24-24	24	610	24	610



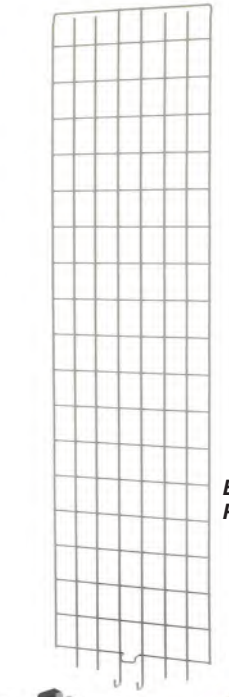
Replacement mounting clips may be ordered.
RPM3-S2SBAG Bag of (4) clips



Enclosure Panels

- An efficient way of enclosing the sides and back of all shelves in a unit to contain stored contents.
- Slot opening: 3" W x 3⅞" H (76 x 98mm).
- Designed to work on MetroMax i, MetroMax 4, and MetroMax Q units. Mounting clips included.
- CRS wire with durable taupe epoxy finish. Mounting clips — Acetyl
- Replacement mounting clips for enclosures.
  MetroMax i: [**Model No. RPMX3-RODTAB**] Bag of (8) clips
  MetroMax 4: [**Model No. RPMX4-RODTAB**] Bag of (8) clips
  MetroMax Q: [**Model No. RPMQ3-RODTAB**] Bag of (8) clips + (1) enclosure adapter

i, 4 and Q Model No.	Width/Height (in.)	(mm)	For Use With Post Height (in.)	(mm)	For Use With Shelf Width (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
MEP35E	12⅜x51¼	315x1300	54	1370	18	457	6¼	2.8
MEP36E	12⅜x59¼	315x1505	63	1600	18	457	7	3.2
MEP37E	12⅜x71¼	315x1810	74	1880	18	457	8¾	4.0
MEP55E	18⅜x51¼	467x1300	54	1370	24	610	9	4.1
MEP56E	18⅜x59¼	467x1505	63	1600	24	610	10¼	4.7
MEP57E	18⅜x71¼	467x1810	74	1880	24	610	11¾	5.3



Enclosure Panel

Panels Required to Enclose Both Ends of Shelving Unit or Cart

Post Height	Shelf Width 21" (530mm)	24" (610mm)
54" (1370mm)	(2) MEP55E	(2) MEP55E
63" (1600mm)	(2) MEP56E	(2) MEP56E
74" (1800mm)	(2) MEP57E	(2) MEP57E



MetroMax i Mounting Clip



MetroMax 4 Mounting Clip



MetroMax Q Mounting Clip

Post Height	Shelf Length 24" (610mm)	30" (760mm)	36" (914mm)	42" (1066mm)	48" (1219mm)	54" (1370mm)	60" (1524mm)	72" (1825mm)
54" (1370mm)	(2) MEP35E	(2) MEP35E	(1) MEP35E		(2) MEP35E	(1) MEP35E		(1) MEP35E
			(1) MEP55E	(2) MEP55E	(1) MEP55E	(2) MEP55E	(3) MEP55E	(3) MEP55E
63" (1600mm)	(2) MEP36E	(2) MEP36E	(1) MEP36E		(2) MEP36E	(1) MEP36E		(1) MEP36E
			(1) MEP56E	(2) MEP56E	(1) MEP56E	(2) MEP56E	(3) MEP56E	(3) MEP56E
74" (1880mm)	(2) MEP37E	(2) MEP37E	(1) MEP37E		(2) MEP37E	(1) MEP37E		(1) MEP37E
			(1) MEP57E	(2) MEP57E	(1) MEP57E	(2) MEP57E	(3) MEP57E	(3) MEP57E

MetroMax® Accessories



Drop in baskets are sized to optimally fill out the space on a MetroMax i shelf frame.

Storage Level Frames

- Open four sided frames accommodate drop-in accessories including wire baskets and stainless drying racks.
- Includes corrosion proof MetroMax i frame and a bag of wedges

Model No.	Nominal Exterior Width (in.)	Width (mm)	Length (in.)	Length (mm)	Interior Width/Length (in.)	Interior Width/Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
M4F1836	18	457	36	914	18x32	457x810	7	3.2
M4F2424	24	610	24	610	24x20	610x510	7 1/2	3.4
M4F2436	24	610	36	914	24x32	610x810	11 1/4	5.1
M4F2442	24	610	42	1060	24x38	610x965	13 1/4	6.0
M4F2448	24	610	48	1220	24x44	610x1120	15	6.8
M4F2460	24	610	60	1524	24x56	610x1370	18 3/4	8.5



NOTE: Wire baskets can be retrofitted to MetroMax i or MetroMax 4 shelves.

MetroMax i: Remove the mats center beams and drop in the baskets.

MetroMax 4: Remove the mats and drop in the baskets.

Wire baskets can complement a MetroMax 4 shelf. If the requirement is to completely fill out the space with baskets, use a MetroMax i storage level frame.

Wire Baskets

- Conveniently hold small items
- 9" (229mm) deep
- Built in storage handles allow easy removal
- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Weight Capacity: 50 lbs. (23kg)

Model No.	Nominal Width (in.)	Nominal Width (mm)	Nominal Length (in.)	Nominal Length (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MB2416XE	24	610	16	406	10	4.5
MB2422XE	24	610	22	560	12	5.5

NOTE: MB2422XE is not adaptable to 24" (610mm) long MetroMax i storage level frames

Configuration Chart — MetroMax i

Frame	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
M4F2436	2	
M4F2442	1	1
M4F2448		2
M4F2460	2	1

Configuration Chart — MetroMax 4

Shelf	Qty. to Fill Out Shelf Frame MB2416XE	Qty. to Fill Out Shelf Frame MB2422XE
MAX4-2436G		1
MAX4-2442G	2	
MAX4-2448G	1	1
MAX4-2460G	3	

NOTE: Remove the shelf mats to install the drop in basket.



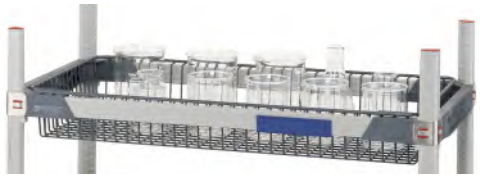
I.V. Storage Basket

- Corrosion resistant taupe epoxy finish (Note: epoxy over a zinc substrate)
- Can be mounted level or at 10 degree slant
- Fits a 24" (610mm) deep MetroMax i shelf
- Weight Capacity: 50 lbs. (23kg)

Model No. IVB1
See Spec Sheet 30.20 for detail.

Configuration Chart

Frame	Qty. to Fill Out Shelf Frame IVB1
M4F2424	1
M4F2442	2
M4F2460	3



Glassware Handling Basket

Vinyl coated. Fits 18 x 36" 457 x 914mm) MetroMax i frame.
Model No. GWBSKT36
See Spec Sheet 52.01 for detail.

Not NSF listed.

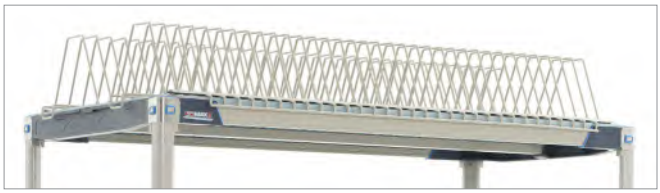
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MetroMax® Accessories

View more about our drying racks on spec sheets - MetroMax i (9.31) or MetroMax 4 (9.32)



Stainless Steel Drop-in Rack



Cutting Board & Tray Racks



Pan Rack



Sorting Pegs for Deep Pans



Drip Tray (For MetroMax i)

Can Rack Accessory

- Front loading, front dispensing can rack holds eight #10 cans or twelve #5 cans.
- Tough, corrosion resistant taupe epoxy finish.
- Mounts on any MetroMax i or MetroMax Q shelf.

i and Q Model No.	Width/Length/Height (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
CR24E	7 7/8 x 25 5/16 x 15	200 x 643 x 381	10	4.5

3-Sided Frames

- 1" (25mm) x 1 1/2" (38mm) structural steel tubing. Includes tri-lobal adapters to attach to posts. (Replacement adapters: **Model No. MTLA** bag of 4)
- Corrosion resistant taupe epoxy finish.
- Use as a 3-sided ledge to contain bulky items or to create "roll under" storage bays.

i, 4 and Q Model No.	Nominal Width (in.)	(mm)	Nominal Length (in.)	(mm)	Approx. Pkd. Wt. (lbs.)	(kg)
M3TF1860E	18	457	60	1524	18	8.2
M3TF2424E	24	610	24	610	12	5.4
M3TF2430E	24	610	30	760	13	5.7
M3TF2436E	24	610	36	914	14	6.4
M3TF2442E	24	610	42	1066	16	7.3
M3TF2448E	24	610	48	1219	18	8.2
M3TF2454E	24	610	54	1370	19	8.6
M3TF2460E	24	610	60	1524	20	9.1



3-sided frame

MetroMax® Accessories

Stem Casters

- Promotes easy cleaning. Casters allow shelving units to be moved easily for access to floors and walls.
- Efficient Transport: Create a cart to efficiently move supplies throughout a facility or campus.



5PCX



5PCBX



5MDXA



5MDBXA



5MPX



5MPBX



5MPXGSA



5MPBXGSA



Bumpers included with stem casters.



Truck Dolly Base

Polymer Stem Casters

- Corrosion resistant performance: all-polymer horn, stainless steel axle, 5" (127mm) diameter polyurethane wheel, sleeve-style axle bearing, and an optional toe-operated brake mechanism. **Note:** the stem and swivel raceway are plated steel.
- Models available with antimicrobial product protection built into the tread.
- Load rating of 300 lbs. (135kg) and a temperature range from -20° to 120° F (-29° to 49° C) [continuous].
- Bumpers included.

Model No.	Model No. Antimicrobial.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5PCX	5PCXM	5	127	1 1/4	32	300	135	Stem/Swivel	-20°-120°	-29°-49°	2	0.9
5PCBX	5PCBXM	5	127	1 1/4	32	300	135	Stem/Brake	-20°-120°	-29°-49°	2	0.9
5PCRX	—	5	127	1 1/4	32	300	135	Stem/Rigid*	-20°-120°	-29°-49°	2	0.9

***Note 1:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (aluminum) for 5PCRX caster: Model No. P18RC, P21RC, P24RC.
Note 2: Not suitable for cart wash and autoclave applications.

Standard Stem Casters

- Plated caster horns and hardware. Bumper included with each caster.
- Swivel, Swivel with Brakes, and Rigid Caster options available.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MX	5	127	1 1/4	32	200	90	Stem/Swivel	Resilient, Flat	-20°-160°	-29°-71°	2 1/2	1.1
5MBX	5	127	1 1/4	32	200	90	Stem/Brake	Resilient, Flat	-20°- 160°	-29°-71°	2 5/8	1.2
5MRX	5	127	1 1/4	32	200	90	Stem/Rigid*	Resilient, Flat	-20°- 160°	-29°-71°	3 1/2	1.5
5MDXA	5	127	1 1/4	32	250	113	Stem/Swivel	High Modulus Donut	-20°-180°	-29°-82°	2 1/2	1.1
5MDBXA	5	127	1 1/4	32	250	113	Stem/Brake	High Modulus Donut	-20°-180°	-29°-82°	2 5/8	1.2
5MDRXA	5	127	1 1/4	32	250	113	Stem/Rigid*	High Modulus Donut	-20°-180°	-29°-82°	2 3/8	1.1
5MPX	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBX	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRX	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Stainless Steel Cart-Washable Stem Casters

- Stainless horn, axle, and stem with sealed bearings. Bumper included with each caster.

Model No.	Wheel Diameter (in.)	Wheel Diameter (mm)	Face (in.)	Face (mm)	Load Rating (lbs.)	Load Rating (kg)	Type	Wheel Tread	Temperature Range (Continuous Usage) (Fahrenheit)	Temperature Range (Continuous Usage) (Celsius)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
5MPXGSA	5	127	1 1/4	32	300	135	Stem/Swivel	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/8	0.9
5MPBXGSA	5	127	1 1/4	32	300	135	Stem/Brake	Polyurethane, Flat	-20°-180°	-29°-82°	2 1/4	1
5MPRXGSA	5	127	1 1/4	32	300	135	Stem/Rigid*	Polyurethane, Flat	-20°-180°	-29°-82°	2	0.9

***Note:** Rigid casters are held in place by a connecting channel. When ordering, shelf width **must** be provided. Rigid connecting channel (stainless steel): Model No. 18RS, 21RS, or 24RS.

Replacement Bumper for MetroMax i and MetroMax Q

Model No. M9992DBX



Replacement Bumper

Truck Dolly Bases

For heavy duty mobile applications. Truck dollies are available in aluminum or stainless construction with corner bumpers or wrap-around bumpers. For more information, refer to Spec Sheet 11.37.

MetroMax shelving mounts to truck dolly bases with the included dolly hardware.

23141 SUNY Faye Corey Student Union

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MetroMax® Accessories

Super Slide

- Mounts to 24" (610mm) deep shelves.
- Easily attaches to the shelf frame (under the mats) and is sized to hold 3", 5", 6", and 8" (76, 127, 152, 203mm) tall tote boxes.
- Models available for MetroMax i and MetroMax 4.
- Corrosion-resistant taupe epoxy finish.

i Model No.	4 Model No.	Width (in.)	Width (mm)	Length (in.)	Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MXSS2E	MAX4-SS2E	20 3/8	520	21 5/8	550	10 1/4	260	5 1/4	2



MXSS2E

Metro® Tote Boxes for Super Slide System

Model No. White Totes	Model No. Natural Totes	Width/Length (in.)	Width/Length (mm)	Height (in.)	Height (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MTB93030W	TB93030NAT	17 1/2 x 22 3/8	457x570	3	75	0.44	0.012
MTB93050W	TB93050NAT	17 1/2 x 22 3/8	457x570	5	127	0.79	0.022
MTB93060W	TB93060NAT	17 1/2 x 22 3/8	457x570	6	150	0.97	0.027
MTB93080W	TB93080NAT	17 1/2 x 22 3/8	457x570	8	203	1.32	0.037



Adjustable Slides

- Slides can be adjusted left to right to accommodate a variety of pan, tray, and container sizes.
- MetroMax i and Q models available.
- Corrosion-resistant taupe epoxy finish.

i Model No.	Q Model No.	Fits Shelf Width (in.)	Fits Shelf Width (mm)	Shelf Spacing (in.)	Shelf Spacing (mm)	Length	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MX24SE	MQ24SE	24	610	22	559	Adjustable	12 3/4	6

Shelf spacing is measured from the top of one shelf to the top of the next.



MX24SE

Handles

Use handles on mobile units to improve maneuvering and ergonomics. Handles fit all MetroMax shelving units. Stainless steel material offers long lasting performance.

Extended Handle

- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MEH18S	18	457	4.5	113	2.5	1.1
MEH24S	24	610	4.5	113	2.7	1.3

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Extended Handle

Easy-Grip Handle

- Ergonomic design.
- Type 304 stainless steel handle and reinforced nylon tri-lobal adapters.

i, 4 and Q Model No.	Fits Shelf Depth (in.)	Fits Shelf Depth (mm)	Extension Depth (Post to Edge of Handle) (in.)	Extension Depth (Post to Edge of Handle) (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)
MERGH18S	18	457	6	151	2.5	1.1
MERGH24S	24	610	6	151	3.0	1.4

NOTE: Stainless steel fasteners are provided with each handle to secure the handle to the post for heavier duty applications



Easy-Grip Handle

Replacement Tri-Lobal Adapters

Model No. MTLA

4 pair per bag



MTLA



Mounted to polymer post

Job _____

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MetroMax® Accessories

We put space to work.

"S" Hooks

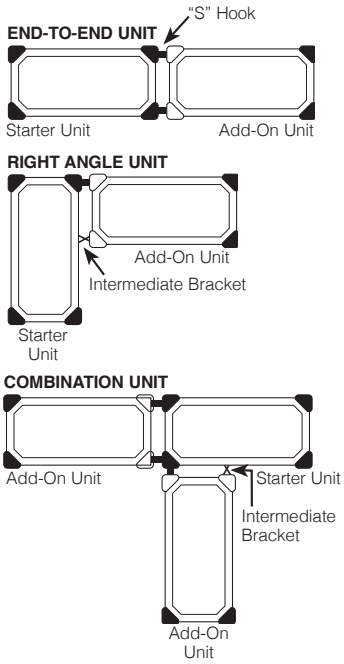
"S" Hooks eliminate the need for adjacent posts saving time and money. Right angle units create open corners in tight spaces for easy access. Use the components below when configuring units from loose shelves and posts.



MetroMax i End-to-End Unit



MetroMax 4 Right Angle Unit



MetroMax i



"S" Hook Kit
Includes (1) "S" Hook and (1) Collar plug.
Model No. **M9995**



Intermediate "S" Hook Kit
Includes (2) "S" hooks and intermediate bracket, (2) Collar plugs.
Model No. **MX9996**

"S" Hooks per storage level	MetroMax i
End-to-End	(2) M9995
Right Angles	(1) MX9996
Combination Unit	(2) M9995 (1) MX9996

MetroMax 4



"S" Hook Kit
Model No. **MAX4-9995**



Intermediate "S" Hook Kit
Model No. **MAX4-9996**

"S" Hooks per storage level	MetroMax 4
End-to-End	(2) MAX4-9995
Right Angles	(1) MAX4-9996
Combination Unit	(2) MAX4-9995 (1) MAX4-9996

MetroMax Q



"S" Hook
Model No. **M9995**



Intermediate "S" Hook Kit
Model No. **Q9995Z**

"S" Hooks per storage level	MetroMax Q
End-to-End	(2) M9995
Right Angles	(1) M9995 (1) Q9995Z
Combination Unit	(3) M9995 (1) Q9995Z

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11 40 01-479

Submittal Sheet

09/15/2026

ITEM# 2.73 - SHELVING, UNIT (EXISTING) (1 REQ'D)

Custom

SHELVING, UNIT (EXISTING)

11 40 01-480

Description: SHELVING, UNIT (EXISTING)

Notes: SHELVING, UNIT (EXISTING)

11 40 01-481

Submittal Sheet

09/15/2026

ITEM# 2.74 - OPEN NUMBER (1 REQ'D)

Custom

OPEN NUMBER

11 40 01-482

Description: OPEN NUMBER

Notes: OPEN NUMBER

Submittal Sheet

09/15/2026

ITEM# 2.75 - DOLLY, DISHWASHER RACK (7 EA REQ'D)

John Boos D2020-GT

Glass Rack Dolly, open frame design, single stack, for 20" x 20" racks, all aluminum welded construction, 3" swivel plate casters

11 40 01-484

SPEC SHEET

"D20" GLASS RACK DOLLY

All Aluminum Welded Construction

FEATURES:
- Welded Aluminum Construction
- 3" Plate Casters
- For 20"x20" Glass Racks (Sold Separatly)
- Open Frame, SIngle Stack Design

SPECIFICATIONS:
- Fully Welded Construction
- Heavy DutyGA Aluminum Plate With Extruded Aluminum Tubing For Frame

CERTIFICATIONS:



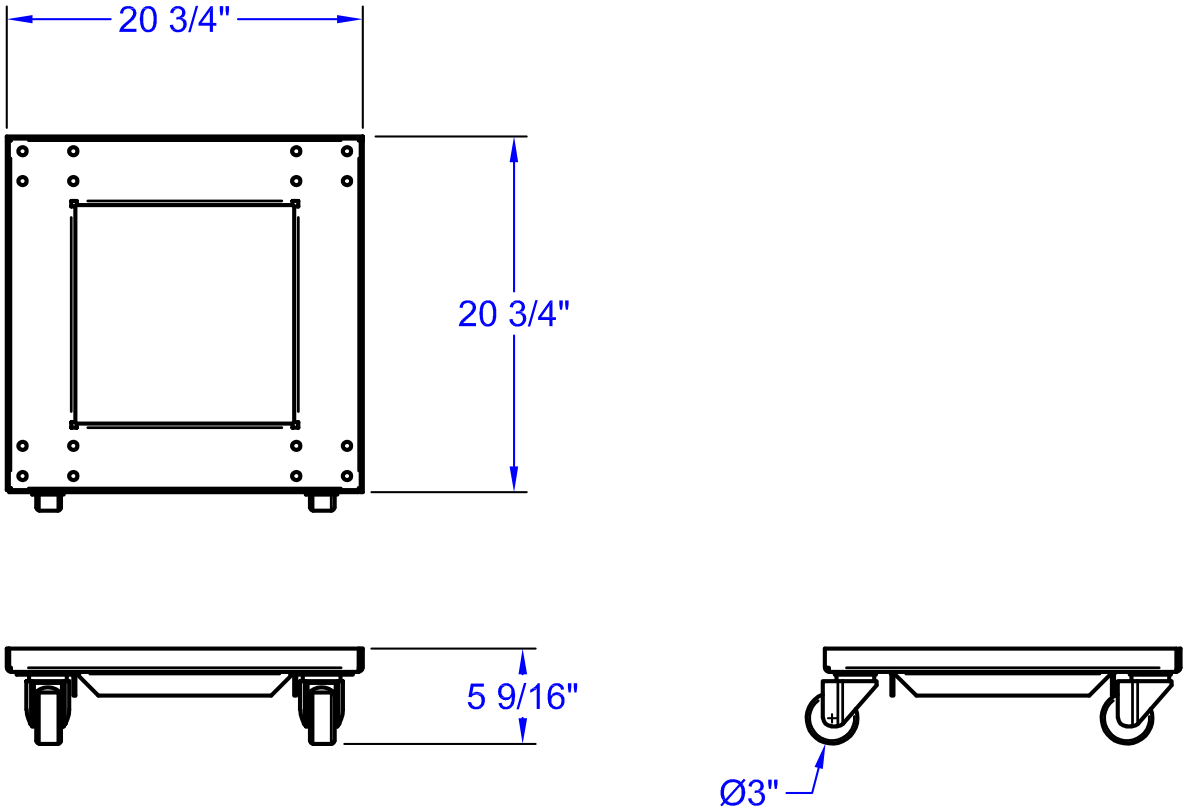
D2020-GT

"D20" GLASS RACK DOLLY

MODEL	DESCRIPTION	WEIGHT (LBS)
D2020-GT	Fits 20"x20" Glass Racks	21

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



"D20" GLASS RACK DOLLY

MODEL	DESCRIPTION	WEIGHT (LBS)
D2020-GT	Fits 20"x20" Glass Racks	21

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

11 40 01-486

Submittal Sheet

09/15/2026

ITEM# 2.76 - POKER CHIP DOLLY (8 EA REQ'D)

Metro PCD11A

Quick Ship - Poker Chip Dish Dolly, 26-5/8"W x 26-5/8"D x 31-15/16"H, adjustable, dish size 4-1/4" to 11-3/4", removable dividers & towers, two-handed access, recessed handles, 5"Dia. swivel casters with neoprene wheels (2 with brakes), chip-resistant polymer shell with Microban® antimicrobial protection, aesthetic blue, vinyl dust/water splash cover, NSF

11 40 01-487

We put space to work.

Adjustable Polymer "Poker Chip" Dish Dolly — PCD Series



PCD11A

NSF

Adjustable:

- Metro's Adjustable Poker Chip Dish Dolly is perfect for holding multiple size dishes — anything from small 41/4-inch dishes to 11¾-inch dinner plates and platters.
- Easy one-handed adjustments on the underside of the dolly allows for flexibility and maximum loading density.

Maneuverable:

- Four recessed handles make it easy to maneuver in and out of tight areas and saves space. The compact design allows for maximum space utilization and convenient under counter storage.
- Four 5" (127mm) diameter swivel casters (two with brakes) with neoprene wheels provide for easy maneuverability and positioning.

Two-Handed Access:

- Unique design allows fast, safe and easy two-handed access to all dish columns. Minimize dish breakage and easily load and unload dishes.

Durable Construction:

- Sturdy polymer construction is extremely safe for dishes, easy to clean, and is resistant to cracking, peeling or chipping.

Sanitary:

- Dividers and tower are removable to facilitate cleaning.
- Smooth, rounded corners and seamless cart surfaces eliminate cracks and crevices and simplify cleaning.
- Built-in drain holes promote cleanability and eliminates the possibility of water build up.
- Dishes are stored 12" (305mm) above the floor surface, minimizing dust and water marks from floor dirt and splashing.
- Included translucent vinyl cover protects clean dishes from dust and water splashes while in storage and allows workers to view contents without removing the cover.
- NSF Listed.

Microban® Antimicrobial Product Protection**:

- Cart body has built-in *Microban® Antimicrobial Product Protection which inhibits the growth of bacteria, mold, mildew, and fungi that cause odors, stains, and product degradation.

**Not available in Canada.

*Microban® and the Microban® symbol are registered trademarks of the Microban Products Company, Huntersville, NC.

All Metro Catalog Sheets are available on our website: www.metro.com

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

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Information and specifications are subject to change without notice. Please confirm at time of order.

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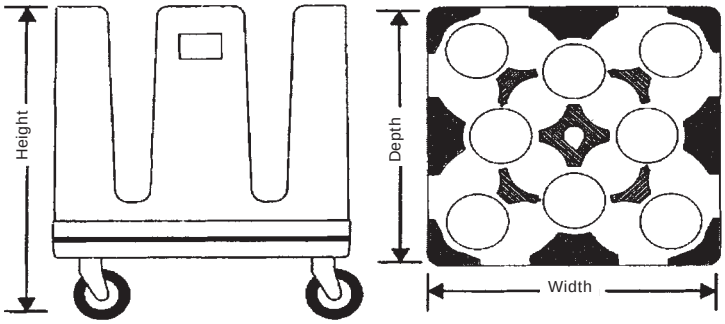
Job _____

16.21

Adjustable Polymer "Poker Chip" Dish Dolly — PCD Series

We put space to work.

Plate Sizes 5½"-6⅜" • 8 Columns (40 Per) • Capacity* = 320



Specifications

- Material: High-density polymer containing Microban Antimicrobial product protection.
- Construction: Seamless, molded polymer construction, equipped with handgrips on all four sides.
- Casters: Four B5DN swivel casters (two with brakes). Ball bearing swivel; ball bearing axle. Nickel-plated, pre-lubricated casters with neoprene tires. Casters are bolted to an internal metal support plate.
- Protective Cover: Standard heavy-duty 6-mil vinyl cover.
- Standard Unit: Four dividers, center column and protective cover provided with each dolly.

Dimensions

Model No.	Height (in.)	Height (mm)	Width/Depth (in.)	Width/Depth (mm)	Approx. Pkg. Wt. (lbs.)	Approx. Pkg. Wt. (kg)
PCD11A	31 15/16	812	26 5/8	677	65	30

*Loading capacity dependent upon china shapes and thickness. Usable column height is 20" (508mm). Please contact your Metro Representative for square plate capacity.

Accessories

Model No.	Description
AD11A	4 Additional Dividers
PCDV11A	Additional Cover

SAMPLE CONFIGURATIONS (Standard Unit)

Plate Sizes 6½"-7⅜"
8 Columns
*Capacity = 320

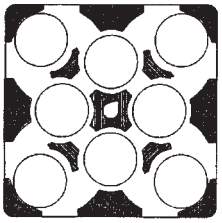


Plate Sizes 7½"-8½"
5 Columns (60 Per)
*Capacity = 300

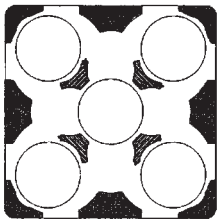


Plate Sizes 8⅝"-9½"
4 Columns (60 Per)
*Capacity = 240

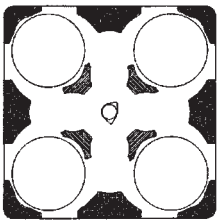
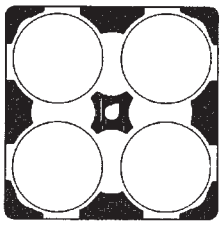


Plate Sizes 9⅝"-11¾"
4 Columns (60 Per)
*Capacity = 240



SAMPLE CONFIGURATIONS (Accessory Dividers Required)

Plate Sizes 4¼"-4⅝"
16 Columns (40 Per)
*Capacity = 640

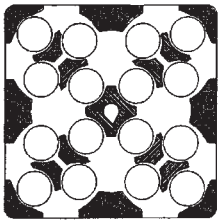
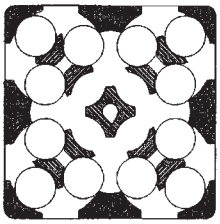
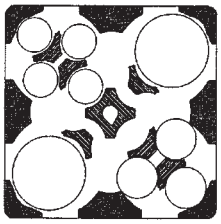


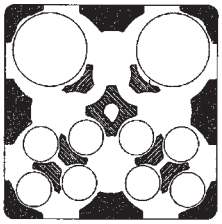
Plate Sizes 4¾"-5⅜"
12 Columns (40 Per)
*Capacity = 480



4 Columns (40 Per) 4¼"-4⅝"
2 Columns (60 Per) 7½"-9½"
3 Columns (40 Per) 4¾"-5⅜"



8 Columns (40 Per) 4¼"-4⅝"
2 Columns (60 Per) 7½"-9½"



11 40 01-489

Submittal Sheet

09/15/2026

ITEM# 3.01 - REMOTE REFRIGERATION SYSTEM (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite LCH0015MBACZA0000

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.06
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

Description: Remote Refrigeration System (Cost incl in 2.05)

Notes: Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.06
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

11 40 01-491

Submittal Sheet

09/15/2026

ITEM# 3.02 - REMOTE REFRIGERATION SYSTEM (COST INCL IN 2.05) (1 EA REQ'D)

ThermalRite LCH0060LCACZC2463

Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.07
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

Description: Remote Refrigeration System (Cost incl in 2.05)

Notes: Condensing Type: Scroll, Air-Cooled
Location: Outdoor
Serves Item: 2.05 and 2.07
Approximate line run shall be verified by KEC
System shall be installed complete with all necessary components and accessories as described in Electrical and Mechanical Requirement Sections of General Conditions of Foodservice Equipment Specifications.
Confirm location with architect prior to ordering.

SECTION 11 52 13 - PROJECTION SCREENS

PART 1 GENERAL

1.1 STIPULATION

A. The specifications sections “General Conditions to the Construction Contract,” “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto and shall have the same force and effect as if printed herewith in full.

1.2 SUMMARY

A. Section includes manual and electrically operated projection screen surfaces, fabrics, construction, supplemental devices, and installation and operating mechanisms and accessories.

B. Products listed in this section shall be supplied with both a screen and a roller device provided by the same manufacturer as one complete assembly and warranty.

C. Refer to 27 00 00 - Communications General Appendix A for individual contractor responsibilities.

D. Related Sections
1. Electrical (26 00 00).
2. Communications (27 00 00).

E. Definitions
1. Gain: The screen's luminance or brightness measured perpendicular to the screen center, measured relative to a block of magnesium carbonate which serves as the standard for 1.0 gain. The gain shall be measured in accordance with SMPTE RP 94-2000.
2. Half Gain Viewing angle: The angle from the perpendicular center of the screen at which the light measured from the screen is equal to one half the values measured in the test for gain.
3. Ambient Light Reflectivity: The amount of light reflected from the screen from undesirable off axis sources as a percentage of the light incident on the screen. The measurement is taken perpendicular to the screen and the light source is at 45 degrees from the perpendicular. The ambient light reflectivity is an indicator of the potential screen contrast which is independent of projector contrast ratio, room illumination level or room surface reflectivity.
4. Format: Proportion of projection screen viewing area expressed as a ratio of height to width.
    a. NTSC or Video Format: 1.00 to 1.33.
    b. HDTV Format: 1.00 to 1.78.
    c. Wide Format: 1.00 to 1.6.
    d. Square: 1.0 to 1.0.
    e. Cinemascope or Anamorphic Format: 1.00 to 2.35.

f. Widescreen (Letterbox) Format: 1.00 to 1.85.

F. References
1. The products described in this specification shall be designed and manufactured according to the latest revision of the following standards (unless otherwise noted).
   a. International Code Council (ICC) International Building Code
   b. Society of Motion Picture and Television Engineers (SMPTE) SMPTE RP 94-2000 - Gain Determination of Front Projection Screens
   c. National Fire Protection Association (NFPA) NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
   d. ASTM International ASTM E84 – 09 – Standard Test Method for Surface Burning Characteristics of Building Materials
   e. Underwriters Laboratories
      1) UL94, (harmonized with IEC 60707, 60695-11-10 and 60695-11-20 and ISO 9772 and 9773), the Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances testing
      2) UL94 V-0
      3) UL94 5V

1.3 SUBMITTALS

A. Projection Screen Furnishing Contractor:
1. Product Data: Manufacturer’s standard specifications, and descriptive literature, including:
   a. Catalog cut-sheets.
   b. Wiring Diagrams.
   c. Warranty process requirements for pre-project submittal, field inspection, final project approval, and warranty extensions.
   d. Manufacturer’s installation instructions.

B. Projection Screen Installing Contractor:
1. Shop Drawings: Graphic information specifically prepared for this project, including:
   a. Dimensioned plans, elevations, and construction details indicating full extent of projection screen work, including anchors, struts, threaded-rod hangers, and safety cables.
   b. Verified field dimensions.

1.4 QUALITY ASSURANCE

A. Obtain each type of projection screen required from a single manufacturer as a complete unit, including necessary mounting hardware and accessories.

1.5 DELIVERY STORAGE AND HANDLING

A. Deliver, store, and handle products in accordance with manufacturer’s instructions.

B. Deliver in manufacturer’s original packaging with identification labels intact.

C. Store protected from exposure to harmful weather conditions, and at temperature conditions in accordance with manufacturer's instructions.

D. Handle with care to avoid damage. Do not install damaged products.

PART 2 PRODUCTS

2.1 PROJECTION SCREENS

A. Acceptable Manufacturer: Da-Lite Screen Company, Inc. Contact: P.O Box 137, 3100 N. Detroit St., Warsaw, IN 46581-0137; Telephone: (800) 622-3737, (574) 267-8101; Fax: (877) 325-4832, (574) 267-7804; E-mail: info@da-lite.com; website: www.da-lite.com
   1. Da-Lite Screen Company, Inc
   2. Draper Inc.
   3. Screen Innovations

B. PROJECTION SCREEN SYSTEMS
   1. Projection screen product information is listed on the TA-Series drawing schedules.
   2. Projection screens shall be provided as complete systems including all accessories required for a complete installation.
   3. Electrically operated screens shall be provided with low voltage control switches with up, down, and stop buttons.

C. SCREEN MATERIALS
   1. Non-drying, stabilized additives shall be added to the vinyl to maintain flexibility and provide functionality over a minimum temperature range of 40 to 100 degrees Fahrenheit (4 to 38 degrees Celsius), including heat stabilizers and non-phthalate plasticizers. Phthalate type plasticizers are not acceptable due to the possibility of negative health impact.
   2. Fire retardants shall be added to the base materials to reduce smoke and flame spread. The screen shall have all appropriate labels and documentation as listed in those sections. Without exception, screens which do not meet these requirements are not acceptable and will not be approved as equivalent.
   3. Unless specified as a perforated screen, the screen shall be at least 97% opaque to maintain maximum contrast ratio. Projected light from the front shall not pass through the screen to be reflected back to the front of the screen. Ambient light from behind the screen shall not pass to the front of the screen. Non-perforated screens which are translucent are not acceptable.
   4. The screen shall be seamless. Seams will cause deformation of the screen while rolled up and are therefore not acceptable. Seams in the viewable area are visible to the audience and are not acceptable. Seams in the leader of rolled up screens will telegraph an impression into subsequent wraps of material which are viewable and therefore not acceptable.

D. SCREEN SIZES

1. Projection screen image sizes are shown on the schedules included in the TA-Series drawing. For each screen, provide the specified and sized screen fabric with black drop above the viewing area, black side masks, bottom mask, tensioning devices (if applicable) and batten to meet the intent of the specifications as noted above. Screens should be ordered with no more black drop than required to ensure that the screen is fully hung when deployed.

E. OPTICAL PERFORMANCE
1. For each type of screen shown in the drawings and listed in the project manual the optical performance shall meet or exceed the values specified.
2. The screen material shall be a flexible front projection screen surface formulated for high output broadcast quality projection systems. The material shall be able to produce images with the strictest color fidelity and white field uniformity standards.

F. ROLLERS
1. Rigid metal rollers used to operate manual and electric screens may vary in size from 3 inches to 8 inches (76.2 to 203.2 mm) and shall be fabricated from either steel or aluminum. The circular cross section of the roller shall be modified such that the radius of the roller is reduced by the screen thickness near the point where the screen attaches to the roller.
2. The overall effect shall be that there is no step in the layers of the screen every 360 degrees as it wraps around the roller. Periodic horizontal deformations or “laddering” in the screen from wrapping around the roller are not acceptable.
3. Rollers shall remain linear along the axis without deformation or sagging that will cause deformation in the screen when rolled up for extended periods.

G. PROJECTION SCREEN HOUSINGS
1. Housings that are not fully metallic shall be manufactured from material that is fully compliant with and certified to comply with UL94, NEC 300-22c and ASTM E84 as referenced above.
2. Screen assemblies shall comply fully with section 300-22(c) of the National Electrical Code and all other sections that apply.
3. Screen assemblies shall be provided by the manufacturer with integral structural members for safely mounting to the building using standard construction materials such as chain, threaded rod, and strut.

2.2 PROJECTION SCREEN SYSTEM

A. Type 1: PST-A 275" diagonal (135"x240"), ceiling recessed projection screen
1. Screen Mounting: Ceiling Recessed
   a. Mounting Hardware: Included Mounting Hardware
2. Screen Size: 108" H x 192" W
3. Acceptable Screens:
   a. Tensioned Screen Viewing Surface:
      1) Front Projection, flame retardant, mildew-resistant vinyl.
      2) Gain 1.1
      3) Viewing Angle: 85-degree half angle

b. Acceptable Materials
   1) HD Progressive 1.0
c. Back Drop
   1) Standard (12")

PART 3 EXECUTION

3.1 INSTALLERS

A. Provide experienced and qualified technicians to install electrically operated projection screens.

3.2 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions.

3.3 EXAMINATION

A. Site verification of conditions:
   1. Verify that conditions of substrates previously installed under other sections of contracts are acceptable with screen installation.
   2. Ensure electrical power supply is installed to meet electrically operated projection screen requirements, and in accordance with Section 26 05 00 – Common Work results for electrical.
   3. Verify type and location of power supply.
   4. Inform Architect of unacceptable conditions immediately upon discovery.
   5. Proceed with installation only after unacceptable conditions have been corrected.

B. Examine walls, ceilings, and conditions under which this work is to be performed. Notify the Architect in writing of conditions detrimental to proper completion of the work. Beginning work means that the Installer accepts substrates and conditions.

3.4 COORDINATION

A. Coordinate installation of electrically and manually deployed roller screens with locations of other wall and ceiling mounted components such as visual display boards, casework, structural framing, light fixtures, air diffusers, ducts, and fire sprinklers to eliminate potential conflicts.

B. Coordinate requirements for blocking, construction of recesses, and auxiliary structural supports to ensure adequate means for installation of screens.

C. Coordinate installation of recessed mounted screens with construction of suspended ceilings or gypsum board ceilings.

PROJECTION SCREENS

3.5 INSTALLATION

A. Arrange for timely delivery of the screen from the manufacturer. Do not store the screen for extended periods prior to installation. Coordinate pathway access to bring the screen into the building as required.

B. Install screens in accordance with the approved shop drawings. Strictly comply with the manufacturer's instructions and recommendations. Comply with all requirements as specified in this Section. Comply with all referenced standards.

C. Install projection screens at locations and heights indicated on drawings. Verify locations in field with Architect.

D. Provide and install blocking in all walls as required. Provide and install appropriate structural support in ceilings as required. Work ceiling tiles around openings for flush ceiling screens.

E. Accurately plumb, level, align, square and brace screens.

3.6 ADJUSTING TOUCH-UP AND REPAIR

A. After installation of hardware, adjust and correct hardware to leave operating parts in perfect condition.

B. Touch-up damaged shop coatings and repair minor damage to eliminate all evidence of repair to the satisfaction of the owner’s representative.

C. Remove and replace work that cannot be satisfactorily repaired.

3.7 TESTING AND PROTECTING

A. Operate each screen three times minimum. Ensure screens properly extend and retract and that screen is level and viewing surface plumb when extended. Adjust to correct deficiencies. Verify that the screen operates properly, and that the screen hangs flat without ripples.

B. Protect projection screens from damage resulting from subsequent construction activities. Tape craft paper or other protective membrane over the screen housing opening until directed to remove them. If the protective materials interfere with the operation of the screen, remove power from the unit and document this action with clear and legible labeling.

C. Remove and replace damaged screens.

PROJECTION SCREENS

D. After the building is completely clean and prior to turning over the building to the owner for occupancy, deploy all rollup screens and allow them to hang for at least 72 hours to allow the screen fabric to relax into its natural flat and smooth shape. Remove any new debris and dust that have accumulated on the screen and exposed housing surfaces. After the 72-hour period, return the screens to the rolled-up position.

END OF SECTION

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SECTION 11 61 43 - STAGE CURTAINS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Stage curtains, scrims, and drops.
   2. Draw-curtain tracks.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product and the following:
   1. Draw-Curtain Machines: Include rated capacities, operating characteristics, and electrical characteristics.
   2. Tracks: Capability of each track to support the weight and operation of curtains that it supports.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
   1. Include plans, elevations, sections, and attachment details of curtains.
   2. Include fabric assembly and hanging details.
   3. Dimension operating clearances.
   4. Include documentation of capacity of each batten, track, attachment, and rigging component to support loads.
   5. Locations of equipment components, switches, and controls. Differentiate between manufacturer-installed and field-installed wiring.

C. Samples for Initial Selection: For each type of stage curtain indicated. Include color charts showing full range of colors, textures, and patterns available, together with 12-inch- square Sample (any color) of each fabric type and seam.

D. Samples for Verification: Full width by minimum 36-inch- long section of each fabric from dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Locations of lighting fixtures and cabling, ductwork, piping, and sprinklers.
   2. Rigging equipment for stage equipment.

B. Qualification Data: For Installer.

C. Product Certificates: For the following, from manufacturer:
   1. Fabric: Provide name of flame-retardant chemical used, identification of applicator, treatment method, application date, allowable life span for treatment, and details of any restrictions and limitations.

D. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For stage curtains and rigging to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer of stage curtains.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install stage curtains until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Verify locations of supporting structural elements and construction contiguous with stage curtains and rigging by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of stage-curtain systems that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, faulty operation of rigging.
   2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Provide stage curtains meeting the following requirements as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Flame-Propagation Resistance: Passes NFPA 701.
      a. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant or is treated

with flame-retardant chemicals and whether it requires retreatment after cleaning or after a designated time period of use.

b. Permanently attach 12-inch- square swatch of same fabric and dye lot for each fabric of a curtain assembly to the back of assembly for use as fire-resistance test strip.

2.2 MANUFACTURERS

A. Basis of Design Manufacturers:
1. Curtain: Stage curtains by Drapery Industries Inc., Rochester, NY 14610, Toll free (844-737-2533), Web: www.draperyindustries.com
2. Track: Automatic Device Company, 2121 South 12th Street, Allentown, PA 18103. Toll Free (800-360-2321), web:www.automaticdevices.com

2.3 STAGE CURTAINS

A. The stage curtain project consists of the Main Theatre Stage.

B. Fabrication requirements of Travelers, Boarders, Legs and Cyclorama setting curtains:
1. Curtain panels shall have a certificate of flame retardancy that is permanently affixed to each individual curtain panel. This certificate should be provided by the curtain manufacturer, and properly identify the specific curtain, size, fabric content and applicable fire rating. Special care should be taken to make sure that the requirements for flame retardancy and dates are current and up-to-date.
2. Fabrics described in this section shall be made from 100% inherently flame retardant polyester, and pass NFPA-701.
3. Seams that join fabric widths shall run vertically and be surge stitched for durability. Finished seams shall be free of puckering and loose threads.
4. Velour fabric panels shall have the nap of the pile running in the down direction.
5. Thread shall be suitable for the fabric weight and match the face of the fabric.
6. Stage curtains shall be constructed of fabric from the same dye lot, and shall be first quality goods. Fabric seconds are not acceptable.
7. Unless otherwise specified, all top hems shall be reinforced with 3-½ inch jute webbing on the back side.
8. Rust proof grommets of the #2 or #4 sizes are acceptable.
9. The curtain fullness shall be a minimum of 60% unless stated otherwise.
10. Bottom hems shall be constructed with 5 to 6 inch of height and double-folded to create three layers of fabric. The hem shall have a galvanized jack chain of appropriate size that is sleeved into a lightweight material and then sewn into the top double-folded pocket such that the sleeved chain is elevated, therefore reducing premature wear of the bottom hem.
11. Box pleating shall be twelve inches on center unless otherwise specified. The boarders, legs, and cyclorama curtains shall be fastened to existing rigging with 36-inch tie lines in color black. The travelers shall be fastened to the track rigging and carriers with plated wire S-hooks or CCF-2 curtain to carrier snap fastener. The CCF-2 is used when the curtains are to be moved from location to location or are to be entirely removed for certain productions (architect to specify).

12. Travelers shall have a full ½ width turn-back at the overlapping side hems unless otherwise specified. The outside hems shall have the fabric salvage surge stitched and a single layer 2-inch fold, which is then straight stitched.
13. Boarders, legs, and cyclorama curtains shall have the fabric salvage of the side hems surge stitched and a single layer 2-inch fold, which is then straight stitched.
14. Stage curtains shall be brushed down, and free of loose threads and debris, prior to final inspection.

C. Fabrication requirements of Scenery Scrims (Sharkstooth 8/2):
1. Fabrics must be vat dyed unless specified as a natural color. All curtain panels shall have a certificate of flame retardancy that is permanently affixed to each individual curtain panel. This certificate should be provided by the curtain manufacturer, and properly identify the specific curtain, size, fabric content and applicable fire rating. Special care should be taken to make sure that the requirements for flame retardancy and dates are current and up-to-date.
2. Fabrics must be flame proofed by the vat immersion process, in accordance with the requirements of the NFPA-701 test.
3. Fabric composition to be 100% cotton or cotton/polyester blend in color black.
4. Fabric cuts must be full width with no splices.
5. Cuts must be sewn horizontally unless otherwise specified. Seamless fabrics as specified.
6. Top hem must be reinforced with heavy jute webbing double stitched with #4 machine set brass grommets one-foot on center. The sharkstooth scrim curtains shall be fastened to existing baton pipe with 36-inch tie lines in color black.
7. Side hems must be 3 inch double turned and show no selvedge.
8. Bottom hem must have a bottom hem with a suspended inner 6-inch heavy canvas lined pipe pocket with intermediate openings 10-foot on center for inserting pipe weight.

D. Curtain Schedule:
1. Main Valance:
   a. Fabric to be KM-Prestige 26 oz. velour in standard color as selected by architect.
   b. Opening 42 feet wide by 6 feet ’high (VIF).
   c. Quantity: 1 panel.
   d. Fullness 60%.
   e. Lining: none.
2. Main Traveler:
   a. Fabric to be KM-Prestige 26 oz. velour in standard color as selected by architect.
   b. Opening 46 feet wide by 20 feet high (VIF).
   c. Quantity: 1 pair.
   d. Fullness 60%.
   e. Lining: none.
3. Olio Valance:
   a. Fabric to be KM-Prestige 26 oz. velour in standard color as selected by architect.
   b. Opening 44 feet wide by 6 feet high (VIF).

c. Quantity: 3 panels.
d. Fullness 60%.

4. Olio Traveler:
   a. Fabric to be KM-Prestige 26 oz. velour in standard color as selected by architect.
   b. Opening 44 feet wide by 20 feet high (VIF).
   c. Quantity: 1 pair.
   d. Fullness 60%.
5. Cyclorama Boarders:
   a. Fabric to be Encore 22 oz. velour in color black.
   b. Opening 44 feet wide by 6 feet high (VIF).
   c. Quantity: 2 panels.
   d. Fullness 60%.
6. Cyclorama Legs:
   a. Fabric to be Encore 22 oz. velour in color black.
   b. Opening 7 feet wide by 20 feet high (VIF).
   c. Quantity: 2 pair.
   d. Fullness 60%.
7. Sharkstooth Scrim:
   a. Fabric to be 2-thread 3.4 oz./square yrd., color to be natural, white, black, sky-blue. Cotton or cotton/poly blend, flame resistant.
   b. Opening 44 feet wide by 20 feet high (VIF).
   c. Quantity: 1 panel (seamless).
   d. Fullness 0%.
8. Cyclorama Curtain:
   a. Fabric to be Encore 22 oz. velour in color black.
   b. Opening 44 feet wide by 17 feet, 5 inches high (VIF).
   c. Quantity: 1 panel (stationary).
   d. Fullness 60%.

2.4 CURTAIN TRACKS

A. The Main Theatre Stage (SC-1) shall use existing tracks and rigging, in addition to new model #06 style rotodraper hardware for mid-stage legs. The Black Box Theater (SC-2) shall have new cyclorama model #242-R Rig-I-Flex walk along tracks.

B. Rotordraper pivot arm (SC-1 Legs): Provide new model #06-A Rotodraper with 6 feet long, 1-inch O.D. schedule #40 pipe.
   1. Model #06-A includes indexing plate and spring loaded roller latch to secure the device at 15 degree intervals of rotation.
   2. Provide black cotton cord tow-line for all.
   3. Fasten rotodraper to existing rigging with appropriate sized C-clamps.

C. Cyclorama track (SC-2): Provide new Rig-I-Flex model #242R walk along track.
   1. Walk along 11-gauge extruded aluminum I-beam track with black finish.
   2. Track shall be rigidly supported from ceiling clamps (Model 1423(BL)) or hanging clamps (Model4208(BL) to existing pipe grid system.
   3. Track can be curved to a 2 feet minimum radius for curves up to 90 degrees.

4. Tracks to be furnished complete with all necessary accessories including nylon tired ball bearing carriers with quantity appropriate to corresponding cyclorama curtains.
5. Refer to drawings for layout and dimensions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of stage-curtain work.

B. Examine inserts, clips, blocking, or other supports required to be installed by others to support tracks and battens.

C. Do not begin installation until tracks have been properly serviced and prepared

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate requirements for blocking and structural supports to ensure adequate means for installation.

3.3 INSTALLATION, GENERAL

A. Install stage-curtain system according to curtain manufacturer's written instructions.
1. Dry-fit by lay track sections on floor as indicated on Drawings. Join bent sections to straight sections with splices. Trim track sections as required.
2. Secure or suspend tracks to ceiling grid system with appropriately sized pipe clamps. The track shall be secure, rigid, and true to ceiling grid system line.
3. Clear track channel of metal shavings and construction debris, prior to inserting carriers.
4. Slide carriers onto track channel.
5. Install carrier gates and end stop assemblies.

B. Install traveler curtains on to carriers.

C. Tie boarders and legs securely to battens by apply a double wrap and square knot.

D. Remove and properly dispose of all debris, loose threads and metal shavings. Brush down velour curtains and vacuum as necessary.

3.4 TESTING

A. Test for smooth operation of curtains and carrier components. Correct deficiencies as necessary.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain stage curtains and tracks.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 11 61 43

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SECTION 12 12 30 – ART HANGING AND DISPLAY SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Wall mounted picture hanging system.

1.2 ACTION SUBMITTALS

A. Product Data Submittals: For each product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for picture hanging system. Include furnished specialties and accessories.

B. Shop Drawings:
   1. Include plans, elevations, sections, and attachment details.

C. Samples for Verification: For each type of exposed finish for the following:
   1. Clamps: One of each type of clamp required.
   2. Tension Cables: 12-inch-long sections of each trim profile.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For picture hanging system to include in maintenance manuals.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install picture hanging system for indoor installations until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain picture hanging system from single source from single manufacturer.

2.2 ART HANGING AND DISPLAY SYSTEMS

A. Picture Hanging System:
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.

2.3 MATERIALS

A. Extruded-Aluminum Bars and Shapes: ASTM B221, Alloy 6063.

B. Aluminum Tubing: ASTM B429/B429M, Alloy 6063.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA AMP 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine walls and partitions for proper backing for.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install units in locations and at mounting heights indicated on Drawings. Keep lines straight, level, and plumb. Provide grounds, clips, backing materials, brackets, anchors, trim, and accessories necessary for complete installation.

3.3 CLEANING

A. Touch up factory-applied finishes to restore damaged areas.

END OF SECTION 12 12 30

SECTION 12 24 13 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manually operated, single-roller shades.
   2. Motor-operated, single-roller shades.
      a. Motorized SDN, roll-up fabric interior window shades including motor operator, controls, wiring, and mounting hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations. Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
   1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.
   2. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.

C. Samples for Initial Selection: For each type and color of shadeband material.
   1. Include Samples of accessories involving color selection.

D. Samples for Verification: For each type of roller shade.
   1. Shadeband Material: Not less than 10 inches square. Mark interior face of material if applicable.

E. Product Schedule: For roller shades. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years' documented experience in manufacturing products comparable to those specified in this section. Manufacturers that do not meet the required experience requirements must submit life cycle test data showing minimum 2000 complete operational cycles for each year of warranty showing no failure and that shade remains fit for use as a operable shade).

B. Installer Qualifications: Fabricator of products.

C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Provide one of each type of shade installation condition, total 3 locations as directed by Architect.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8 WARRANTY

A. Initial warranty: Provide an initial two-year warranty on all products and services, including installations, to be free from defects. Products or services found to be defective under normal use during this initial warranty period will be repaired or replaced without charge to the Owner. The warranty period shall begin upon Substantial Completion.

B. Motors and Controls: Five-year limited warranty.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain roller shades from single source from single manufacturer.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Drapery Industries, Inc.
   2. Draper, Inc.
   3. Lutron Electronics Co., Inc.
   4. MechoShade Systems, LLC (Springs Window).

2.3 MANUALLY OPERATED, SINGLE-ROLLER SHADES

A. Product/Manufacturer: Basis of design.
   1. Blueshade; Drapery Industries Inc

B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
   1. Bead Chains: Stainless steel.
      a. Loop Length: Full length of roller shade.
      b. Limit Stops: Provide upper and lower ball stops.
      c. Chain-Retainer Type: Clip, jamb mount.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
   1. Roller Drive-End Location: Right side of interior face of shade.
   2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
   3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

E. Shadebands:
   1. Shadeband Material: Light-filtering fabric.
   2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
      a. Type: Enclosed in sealed pocket of shadeband material.

F. Installation Accessories:
1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
a. Shape: L-shaped.
b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
2. Endcap Covers: To cover exposed endcaps.
3. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.4 MOTOR-OPERATED, SINGLE-ROLLER SHADES

A. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Product/Manufacturer: Basis of design.
1. Motorized SDN Blueshade; Drapery Industries Inc.

C. Type: Motorized vertical roll-up, fabric, window shade with motors, controls, mounting brackets, and other components necessary for complete installation.
1. Mounting brackets.
2. Endcaps and fascia.

D. Shade Motor and Control System:
1. Motorized SDN Blueshade Sonesse Ultra 50 DC RS 485 UL Listed if single roller configuration 24V DC quiet motor with built-in intelligence for RS 485 control. Tubular motor concealed inside each shade roller tube. 4 Nm of torque.
a. Individual Control, Group Control and Individual and Group Control:
1) 6 button RS 485 switch- for 2 groups up/stop/down or 1 group up/stop/down and 3 presets.
2) Bus Distribution:
a) Data Hub for 485 Motor.
3) 5-Way RJ45 Splitter:
a) Building Controllers.
b) SDN Data Panel.
4) User Interfaces:
a) SDN 6 button wall switch (Preprogrammed for master control).
b) Somfy Connect UAI Plus where required by Architect.
5) Accessories:
a) Bus Power Supply, 24V, 1A.
b. Transformer:

1) Power Panel:
a) 10 Motors.

E. Configuration:
1. Single Roller.
a. Mounting.
1) Brackets: 1018 stamped steel, black powder coat, idler height adjuster, field adjustable to wall or ceiling mount.
a) Mounted to ceiling.
b) Mounted to wall.
c) Mounted to jamb.

F. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
1. Roller Drive-End Location: Right side of interior face of shade.
2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

G. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

H. Shadeband Cable System: Manufacturer's standard system for guiding shadeband through range of travel and holding shadeband taut with edges of shadeband supported by side cables.
1. Provide shadeband cable system where indicated on Drawings.

I. Shadebands:
1. Shadeband Material: Light-filtering fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
a. Type: Enclosed in sealed pocket of shadeband material.
b. Color and Finish: As indicated on Drawings.

J. Installation Accessories:
1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
a. Shape: L-shaped.
b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
2. Endcap Covers: To cover exposed endcaps.
3. U-channel for cable runs as indicated on Drawings.
4. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.5 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
   1. Product/Manufacturer: Basis of design.
      a. As indicated on Drawings.
   2. Color: As indicated on Drawings.

2.6 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
   2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
   1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
   2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

B. Electrical Connections: Connect motor-operated roller shades to building electrical system.

C. Roller Shade Locations: As indicated on Drawings.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 TESTING AND DEMONSTRATION

A. Test motorized window shades to verify that controls, limit switches, interface to other building systems, and other operating components are functional. Correct deficiencies.

B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 12 24 13

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SECTION 12 36 61.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Solid surface material countertops, wall cladding, desk tops, and wall caps
   2. Solid surface material backsplashes.
   3. Solid surface material end splashes.
   4. Solid surface material apron fronts.
   5. Solid surface material sinks.

1.2 ACTION SUBMITTALS

A. Product Data: For solid surfacing materials and sinks.

B. Shop Drawings: Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
   1. Show locations and details of joints.
   2. Show direction of directional pattern, if any.

C. Samples for Initial Selection: For each type of material exposed to view.

D. Samples for Verification: For the following products:
   1. Solid surfacing materials, 6 inches square of each color.
   2. Wood trim, 8 inches long.
   3. One full-size solid surface material countertop, with front edge and backsplash, 8 by 10 inches, of construction and in configuration specified.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface materials to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate solid surfacing materials similar to that required for this Project, and whose products have a record of successful in-service performance.

B. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
   1. Build mockup of typical countertop as indicated on Drawings.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of solid surfacing fabrications by field measurements after base cabinets are installed but before fabrication is complete.

1.7 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Corian by DuPont.
   2. Formica Corporation.
   3. Wilsonart LLC.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

2.2 SOLID SURFACE MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.
   1. Type: Provide Standard type unless Special Purpose type is indicated.
   2. Colors and Patterns: As indicated by manufacturer's designations.

B. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
   1. Product/Manufacturer: Basis of design.
      a. Model 810 with offset overflow; Corian by DuPont.
   2. Regulatory Requirements: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for toilet compartments designated as accessible.
   3. Colors and Patterns: As selected by Architect from manufacturer's full range.

C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.3 FABRICATION

A. Fabricate solid surfacing material units according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
   1. Grade: Custom.

B. Configuration:
   1. Front: Straight, slightly eased at top.
   2. Backsplash: Straight, slightly eased at corner.
   3. End Splash: Matching backsplash.

C. Countertops:
   1. 1/2-inch- thick, solid surface material with front edge built up with same material.

D. Backsplashes: 1/2-inch- thick, solid surface material with wood-trimmed edges.

E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
   1. Fabricate with loose backsplashes for field assembly.
   2. Install integral sink bowls in countertops in the shop.

F. Joints:
   1. Fabricate countertops without joints.
   2. Fabricate countertops in sections for joining in field.
      a. Joint Locations: Not within 18 inches of a sink and not where a countertop section less than 36 inches long would result, unless unavoidable.

G. Cutouts and Holes:
   1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
      a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
   2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
   3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

2.4 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
   1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
   1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

H. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION 12 36 61.16

SECTION 12 48 13 - ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roll-up rail mats.
   2. Recessed frames.

1.2 COORDINATION

A. Coordinate size and location of recesses in concrete to receive floor mats and frames.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for floor mats and frames.

B. Shop Drawings:
   1. Items penetrating floor mats and frames, including door control devices.
   2. Divisions between mat sections.
   3. Perimeter floor frames.

C. Samples: For the following products, in manufacturer's standard sizes:
   1. Floor Mat: Assembled sections of floor mat.
   2. Tread Rail: Sample of each type and color.
   3. Frame Members: Sample of each type and color.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For floor mats and frames to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

A. Structural Performance: Provide roll-up rail mats and frames capable of withstanding the following loads and stresses within limits and under conditions indicated:
   1. Uniform floor load of 300 lbf/sq. ft..
   2. Wheel load of 350 lb per wheel.

B. Accessibility Standard: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 ROLL-UP RAIL MATS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
   1. Balco, Inc.
   2. Construction Specialties, Inc.
   3. Nystrom, Inc.
   4. Pawling Corp., Architectural Products Div.

B. Product/Manufacturer: Basis of design.
   1. As indicated on Drawings.

C. Roll-up, Aluminum-Rail Hinged Mats: Extruded-aluminum tread rails 1-1/2 inches wide by 3/8 inch thick, sitting on continuous vinyl cushions.
   1. Tread Inserts: 1/4-inch- high, 28-oz./sq. yd. weight, level-cut, nylon-pile, fusion-bonded carpet.
   2. Colors, Textures, and Patterns of Inserts: As indicated by manufacturer's designations.
   3. Rail Color: As selected by Architect from full range of industry colors and color densities.
   4. Hinges: Aluminum.
   5. Mat Size: As indicated.

2.3 FRAMES

A. Recessed Frames: Manufacturer's standard extrusion.
   1. Extruded Aluminum: ASTM B221, Alloy 6061-T6 or Alloy 6063-T5, T6, or T52.
      a. Color: As selected by Architect from full range of industry colors and color densities.

2.4 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Recessed Frames: As indicated, for permanent recessed installation, complete with corner pins or reinforcement and anchorage devices.
   1. Fabricate edge-frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

C. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

2.5 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and floor conditions for compliance with requirements for location, sizes, minimum recess depth, and other conditions affecting installation of floor mats and frames.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install recessed mat frames and mats to comply with manufacturer's written instructions so that tops of mats will be flush with adjoining finished flooring. Set mats with tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.
   1. Install necessary shims, spacers, and anchorages for proper location, and secure attachment of frames.
   2. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.
   3. Delay setting mats until construction traffic has ended.

3.3 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 12 48 13

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SECTION 14 21 00 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Electric traction elevators.

1.2 DEFINITIONS

A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.

B. Service Elevator: A passenger elevator that is also used to carry freight.

1.3 ACTION SUBMITTALS

A. Product Data:
   1. Electric traction elevators.

B. Product Data Submittals: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal systems.

C. Shop Drawings:
   1. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment.
   2. Include large-scale layout of car-control station and standby power operation control panel.
   3. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

D. Samples for Initial Selection: For finishes involving color selection.

E. Samples for Verification: For exposed car, hoistway door and frame, and signal equipment finishes; 3-inch- square Samples of sheet materials; and 4-inch lengths of running trim members.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as indicated on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.

C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
   1. Submit manufacturer's or Installer's standard operation and maintenance manual, according to ASME A17.1/CSA B44.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

C. Continuing Maintenance Proposal:
   1. Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard one-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
   2. Submit a continuing maintenance proposal from Installer to Owner with terms, conditions, and obligations as set forth in, and in same form as, a "Draft of Elevator Maintenance Agreement," starting on date initial maintenance service is concluded.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.8 COORDINATION

A. Coordinate installation of inserts, sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, inserts, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of work specified in other Sections that relates to electric traction elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

1.9 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
   2. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SUNY CORTLAND REQUIREMENTS

A. All elevators, accessible lifts, dumb waiters shall meet all New York State, NFPA, ASME codes and ADA standards.

B. Elevators and similar equipment shall be accepted by the University only after it is approved by the University recognized inspection agency as specified by FPDC.

C. During construction, the general contractor or elevator subcontractor shall be responsible to ensure that the pits, hoist ways, hatches, door rails, landing sills, and elevator machine rooms are kept clean during construction and thoroughly cleaned before inspection.

D. All passenger elevators shall have 2 speed doors with GAL operators. www.gal.com

E. Elevator Emergency operation: In addition to the requirements of code, the elevator should go to automatic recall mode when the building goes to full alarm system or the pull station is activated. Fireman recall key shall be Northeast PTF 5 for Academic Buildings. A knox box outside of main entrance shall be installed to include the key for Fireman.

F. Provide battery backup for automatic recall even if the elevator is connected generator power.

G. Before acceptance, elevator contractor shall provide 3 keys each for doors, control cabinets and maintenance bypass, and 9 keys of firemen’s service.

H. Elevator ADA/emergency telephones and cameras shall be approved by Networking and Telecommunications Services and the Director of Parking Operations and Security Systems.

I. Independent switch and any special access key controls shall be on the Best Lock system.

J. Use campus approved inspection agency.

K. Provide security camera for each car as specified by FPDC.

L. Provide three separate CAT 6 cables in the ribbon for each car to be utilized for emergency IP phone and camera monitoring.

M. Provide any equipment and software required to communicate with elevator upon completion of installation.

N. Do review safety phone/audio visual requirements with University Police for most up to date needs.

O. Do not install any proprietary process control systems.

2.2 SOURCE LIMITATIONS

A. Obtain electric traction elevators from single manufacturer.
1. Major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cars, and entrances, to be manufactured by single manufacturer.

2.3 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.

B. Accessibility Requirements: Comply with requirements for accessible elevators in the United States Access Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

2.4 ELECTRIC TRACTION ELEVATORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:
1. Otis Elevator.
2. Schindler Elevator Corporation.
3. ThyssenKrupp North America, Inc.

B. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components to be used, as included in standard elevator systems and as required for complete system.

C. Product/Manufacturer: Basis of design.
1. Model 3300 XL; Schindler Elevator Corporation.

D. Elevator Description:
1. Elevator Number(s): 1 – Service Elevator.
2. Machine Type: Gearless traction.
3. Rated Load: 4000 lb.
4. Rated Speed: 150 fpm.

5. Operation System: Selective-collective automatic operation.
6. Elevator shall operate independently.
7. Auxiliary Operations:
   a. Battery-powered automatic evacuation.
   b. Automatic operation of lights and ventilation fans.
   c. Independent service for service elevator.
8. Security Features: Card-reader operation.
9. Restricting access to the rear entrance of Elevator No. 1:
   a. Cab card reader security. Owners' security vendor to install their system into elevator.
   b. Provide the wires that are required to provide access. Security vendor to connect their card reader to elevator controller.
10. Dual Car-Control Stations: Provide two car-control stations; equip only one with required keyswitches if any.
11. Car Enclosures:
    a. Inside Width: 64-1/4 inches from side wall to side wall.
    b. Inside Depth: 92-1/2 inches from back wall to front wall (return panels).
    c. Inside Height: Not less than 89 inches to underside of ceiling.
    d. Front Walls (Return Panels): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Side and Rear Wall Panels: Plastic laminate.
    g. Reveals: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    h. Door Faces (Interior): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    i. Door Sills: Aluminum.
    j. Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    k. Handrails: 1/2 by 2 inches rectangular satin stainless steel, at sides of car.
    l. Floor prepared to receive resilient flooring (specified in Section 09 65 16 "Resilient Sheet Flooring").
       1) Prepare floor to receive finish flooring as indicated on Drawings.
12. Hoistway Entrances:
    a. Width: 48 inches.
    b. Height: 84 inches.
    c. Type: Two-speed side sliding.
    d. Frames: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Sills: Aluminum.
13. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
14. Additional Requirements:
    a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, ASTM A480/A480M, No. 4 finish.
    b. Provide hooks for protective pads in all cars and two complete set(s) of full-height protective pads.
    c. Main Power Supply: 480 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor. Transformer (by others) required for voltages other than 208, 220-240, 440-480 volts. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.

E. Elevator Description:
1. Elevator Number(s): 2 General Purpose – Passenger Elevator.
2. Machine Type: Gearless traction.
3. Rated Load: 2100 lb.
4. Rated Speed: 150 fpm.
5. Operation System: Selective-collective automatic operation.
6. Elevator shall operate independently.
7. Auxiliary Operations:
   a. Battery-powered automatic evacuation.
   b. Automatic operation of lights and ventilation fans.
8. Security Features: Keyswitch operation.
9. Car Enclosures:
   a. Inside Width: 69-5/16 inches from side wall to side wall.
   b. Inside Depth: 52-13/16 inches from back wall to front wall (return panels).
   c. Inside Height: Not less than 89 inches to underside of ceiling.
   d. Front Walls (Return Panels): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
   e. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
   f. Side and Rear Wall Panels: Plastic laminate.
   g. Reveals: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
   h. Door Faces (Interior): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
   i. Door Sills: Aluminum.
   j. Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
   k. Handrails: 1/2 by 2 inches rectangular satin stainless steel, at sides and rear of car.
   l. Floor prepared to receive resilient flooring (specified in Section 09 65 16 "Resilient Sheet Flooring").
      1) Prepare floor to receive finish flooring as indicated on Drawings.
10. Hoistway Entrances:
    a. Width: 36 inches.
    b. Height: 84 inches.
    c. Type: Two-speed side sliding.
    d. Frames: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Doors and Transoms: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Sills: Aluminum.
11. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
12. Additional Requirements:
    a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, ASTM A480/A480M, No. 4 finish.
    b. Provide hooks for protective pads in all cars and two complete set(s) of full-height protective pads.
    c. Main Power Supply: 480 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor. Transformer (by others) required for voltages other than 208, 220-240, 440-480 volts. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.

2.5 TRACTION SYSTEMS

A. Elevator Machines: Variable-voltage, variable-frequency, ac-type hoisting machines and solid-state power converters.
   1. Provide regenerative system that complies with the IgCC.
   2. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
   3. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.

B. Fluid for Hydraulic Buffers: Fire-resistant fluid.

C. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

D. Machine Beams: Provide steel framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 05 50 00 "Metal Fabrications" for materials and fabrication.

E. Car Frame and Platform: Bolted- or welded-steel units.

F. Guides: Roller guides or polymer-coated, nonlubricated sliding guides. Provide guides at top and bottom of car and counterweight frames.

2.6 OPERATION SYSTEMS

A. Elevator shall operate independently.

B. Provide manufacturer's standard microprocessor operation systems as required to provide type of operation indicated.

C. Auxiliary Operations:
   1. Single-Car Battery-Powered Automatic Evacuation: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it moves to the next floor above or below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
   2. Automatic Operation of Lights and Fan: When elevator is stopped and unoccupied with doors closed, lighting, ventilation fan, and cab displays are de-energized after five minutes and are re-energized before car doors open.

D. Security features are not to not affect emergency firefighters' service.
   1. Card-Reader Operation for Elevator No. 1: System uses card readers at car-control stations and hall push-button stations (Basement only) to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. Allow space for card reader in car.

2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at car-control stations and hall push-button stations. Key is removable in either position.
3. Car-to-Lobby Feature: Feature, activated by keyswitch at main lobby, that causes all cars in a group to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

2.7 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams causes doors to stop and reopen.

B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer sounds and doors begin to close at reduced kinetic energy.

2.8 CAR ENCLOSURES

A. Provide enameled or powder-coated steel car enclosures to receive removable wall panels, with removable car roof, access doors, power door operators, and ventilation.
1. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.

B. Materials and Finishes: Manufacturer's standards, but not less than the following:
1. Subfloor:
   a. Exterior, underlayment grade plywood, not less than 5/8-inch nominal thickness.
2. Floor Finish:
   a. As indicated on Drawings.
3. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch fire-retardant-treated particleboard with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels to have a flame-spread index of 25 or less, when tested according to ASTM E84. Plastic-laminate color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range.
4. Fabricate car with recesses and cutouts for signal equipment.
5. Fabricate car door frame integrally with front wall of car.
6. Stainless Steel Doors: Flush, hollow-metal construction; fabricated from stainless steel sheet.
7. Sight Guards: Provide sight guards on car doors.
8. Sills: Extruded or machined metal, with grooved surface, 1/4 inch thick.
9. Ceiling: Metal flush panels, with Six low-voltage downlights in each panel.
10. Ventilation Fan Efficiency: Not less than 3.0 cfm/W.

2.9 HOISTWAY ENTRANCES

A. Hoistway Entrance Assemblies: Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile to accommodate hoistway wall construction.
   1. Where gypsum board wall construction is indicated, frames to be self-supporting with reinforced head sections.

B. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies to comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, based on testing at as close-to-neutral pressure as possible according to NFPA 252 or UL 10B.
   1. Fire-Protection Rating: 1-1/2 hours with 30-minute temperature rise of 450 deg F.

C. Materials and Fabrication: Manufacturer's standards, but not less than the following:
   1. Stainless Steel Frames: Formed from stainless steel sheet.
   2. Stainless Steel Doors and Transoms: Flush, hollow-metal construction; fabricated from stainless steel sheet.
   3. Sight Guards: Provide sight guards on doors matching door edges.
   4. Sills: Extruded or machined metal, with grooved surface, 1/4 inch thick.
   5. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

2.10 SIGNAL EQUIPMENT

A. Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Provide vandal-resistant buttons and lighted elements illuminated with LEDs.

B. Car-Control Stations: Provide manufacturer's standard recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.
   1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
   2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.

C. Emergency Communication System: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset use. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
   1. Product/Manufacturer:
      a. SmartView 2 Elevator Communication Platform; Rath by Avire.
      b. Components:
         1) Machine Room Unit: Part No. 7100.
         2) Elevator Unit: Part No. 7200.
         3) Elevator Unit: 7200M-C118: 7200M with 0.118” lens cover; 7200M-C156: 7200M with 0.156” lens cover.
         4) Lobby and Machine Room Unit: 12-116 Zones available.

c. No alternates will be accepted.

D. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.

E. Hall Push-Button Stations: Provide hall push-button stations at each landing at each elevator as indicated on Drawings.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
2. Equip units with buttons for calling elevator and for indicating desired direction of travel.

F. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
1. Units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.

G. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
1. At manufacturer's option, audible signals may be placed on cars.

H. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above each hoistway entrance at ground floor. Provide units with flat faceplate and with body of unit recessed in wall.
1. Integrate ground-floor hall lanterns with hall position indicators.

I. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

2.11 FINISH MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel, Type B, exposed, matte finish.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, commercial steel, Type B, pickled.

C. Stainless Steel Sheet: ASTM A240/A240M, Type 304.

D. Stainless Steel Bars: ASTM A276/A276M, Type 304.

E. Stainless Steel Tubing: ASTM A554, Grade MT 304.

F. Aluminum Extrusions: ASTM B221, Alloy 6063.

G. Plastic Laminate: High-pressure type complying with ISO 4586-3, Type HGS for flat applications and Type BKV for panel backing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ELECTRIC TRACTION ELEVATORS

A. Comply with manufacturer's written instructions.

B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.

D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.

E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

F. Leveling Tolerance: 1/8 inch, up or down, regardless of load and travel direction.

G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

H. Locate hall signal equipment for elevators as follows unless otherwise indicated:
   1. Place hall lanterns either above or beside each hoistway entrance.
   2. Mount hall lanterns at a minimum of 72 inches above finished floor.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.

B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.4 PROTECTION

A. Temporary Use: Limit temporary use for construction purposes to one elevator. Comply with the following requirements for each elevator used for construction purposes:
   1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
   2. Provide strippable protective film on entrance and car doors and frames.
   3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
   4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
   5. Do not load elevators beyond their rated weight capacity.
   6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
   7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service to include 12 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies to be manufacturer's authorized replacement parts and supplies.
   1. Perform maintenance during normal working hours.
   2. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator(s).

B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

END OF SECTION 14 21 00

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