PROJECT MANUAL

Construction Documents

Volume 2 of 3 — Divisions 08 - 14



Kelly Walsh High School

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Architecture · Planning · Interior Design
315 E. Mountain Avenue Suite 100
Fort Collins, Colorado 80524-2913
970 484-0117 Fax 970 484-0264

SECTION 00 01 10

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SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

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. Hollow metal work.
2. Non-fire rated steel doors and frames.
3. Fire rated steel doors and frames.
4. Thermally insulated steel doors.
5. Steel frames for wood doors.
6. Sound rated steel doors and frames.
7. Steel glazing frames.
8. Factory installed security equipment.
9. Modifications to existing doors and frames for renovation.
10. Accessories including glazing, louvers and matching panels.

B. Related Requirements:
1. Section 08 14 16 "Flush Wood Doors" for wood doors installed in hollow-metal frames.
2. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.
3. Section 08 80 00 "Glazing" for glass view panels in hollow metal doors and frames.
4. Section 09 91 13 "Painting" for field finishing hollow metal doors and frames.
5. Section 28 13 00 “Access Control Systems” for coordination of electrical requirements.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 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.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

C. 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 anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification:
   1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 127 mm).
   2. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:
      a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
      b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

F. Schedule: Provide a schedule of hollow-metal work 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.

G. Templates: Hardware templates for hardware mounted on hollow metal work shall be submitted under Section 08 71 00 directly to the hollow metal manufacturer immediately after approval of the hardware schedule. Report failure to receive templates with reasonable promptness to the General Contractor.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

1.8 QUALITY ASSURANCE

A. Perform work in accordance with DHI "Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware."

B. Blemishes and dents shall be cause for rejection.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work 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 work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Steelcraft; an Ingersoll-Rand company.
   2. Amweld Building Products, a Black Mountain Door LLC company.
   3. Ceco Door Products; an Assa Abloy Group company.
   4. West Central Manufacturing.
   ~~3.~~5. Curries, an Assa Abloy Company.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated 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 at positive pressure according to NFPA 252 or UL 10C.
   1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities

having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR DOORS AND FRAMES

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. For all interior doors and frames, unless indicated otherwise.
   1. Physical Performance: Level A according to SDI A250.4.
   2. Doors:
      a. Type: As indicated in the Door and Frame Schedule.
      b. Thickness: 1-3/4 inches (44.5 mm).
      c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch (1.3 mm).
      d. Edge Construction: Model 2, Seamless.
      e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
   3. Frames:
      a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
      b. Construction: Full profile welded.
   4. Exposed Finish: Factory primed.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Maximum-Duty Doors and Frames: SDI A250.8, Level 4. For all exterior hollow metal doors and frames, unless indicated otherwise.
   1. Physical Performance: Level A according to SDI A250.4.
   2. Doors:
      a. Type: As indicated in the Door and Frame Schedule.
      b. Thickness: 1-3/4 inches (44.5 mm.)
      c. Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch (1.7 mm), with minimum A40 (ZF120) coating.
      d. Edge Construction: Model 2, Seamless.
      e. Core: Manufacturer's standard polystyrene or polyisocyanurate.
   3. Frames:
      a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch (1.7 mm), with minimum A40 (ZF120) coating.
      b. Construction: Full profile welded.
   4. Exposed Finish: Factory primed.

2.5 HOLLOW-METAL PANELS

A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.6 FRAME ANCHORS

A. Jamb Anchors:
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.

2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.7 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. 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.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, 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 E 136 for combustion characteristics.

I. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.8 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:
1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection ratings indicated.
3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).

4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
7. 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 (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Sidelight and Borrowed-Lite 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 butt welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:
    a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
        1) Two anchors per jamb up to 60 inches (1524 mm) high.
        2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
    b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
        1) Three anchors per jamb up to 60 inches (1524 mm) high.
        2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
    c. Compression Type: Not less than two anchors in each frame.
    d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
7. 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.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware. Galvanized frames shall have galvanized reinforcement. Minimum 12 gauge except:
   a. Hinge and Pivot Reinforcements: 7 gage x 1-1/4 inches x 10 inches in length.
   b. Continuous Hinge Reinforcement: 7 gage x 1-14 inches x length of hinge.
2. Metal plaster or mortar guards shall be provided for all mortised cutouts.
3. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
4. Install security contacts and conduits for electrified hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
3. Provide loose stops and moldings on inside of hollow-metal work.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

G. After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall be treated to insure maximum paint adhesion and shall be coated on all accessible surfaces with a rust inhibitive primer which meets or exceeds ASTM B117 salt spray for 150 hours, and ASTM D1735 water fog test for organic coatings for 200 hours, and which is fully cured prior to shipment.

2.9 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 SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 ACCESSORIES

A. Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.
1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
2. Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.
3. 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. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

D. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

E. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

F. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

G. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

H. Minimally Expanding Spray Foam: Hilti "CF 812", or Acceptable Substitution.

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. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame 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.

E. Prior to installation of hollow metal window frames and door sidelite frames, refer to the Drawings for varying glazing stop locations to accommodate mini-blinds. Verify in field with Architect. Incorrect installation shall result in removal and reinstallation.

3.2 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.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that will be filled with grout.
    h. Fill jambs, heads and sills in construction other than masonry with minimal expanding foam insulation.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
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 door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

8. Coordinate frame anchor placement with wall construction and in frame conduits.
9. Coordinate installation with steel columns. Provide closure plates required for finished installation.
10. Coordinate installation of hardware. Hang doors to be free of binding with hardware functioning properly.
11. Coordinate installation of glazing.
12. Coordinate installation of electrical connections to electrical hardware items.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. 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.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

SECTION 08 14 16

FLUSH WOOD DOORS

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. Solid-core doors with wood-veneer faces, including dutch doors.
   2. Fire rated solid core wood doors.
   3. Door lites and door lites with integral blinds.
   4. Factory finishing flush wood doors.
   5. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:
   1. Section 08 71 00 “Door Hardware” for hardware requirements.
   2. Section 08 80 00 "Glazing" for glass view panels in flush wood doors.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of door. Include details of core and edge construction, and trim for openings. Include factory-finishing specifications.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
   1. Dimensions and locations of blocking.
   2. Dimensions and locations of mortises and holes for hardware.
   3. Dimensions and locations of cutouts.
   4. Undercuts.
   5. Requirements for veneer matching.
   6. Doors to be factory finished and finish requirements.
   7. Fire-protection ratings for fire-rated doors.

D. Samples for Initial Selection: For factory-finished door faces.

E. Samples for Verification:
   1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), 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 (200 by 250 mm), with door faces and edges representing actual materials to be used.
      a. Provide Samples for each species of veneer and solid lumber required.
      b. Provide Samples for each color, texture, and pattern of plastic laminate required.
      c. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.
   3. Louver blade and frame sections, 6 inches (150 mm) long, for each material and finish specified.
   4. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer with not less than three years documented experience that is a certified participant in AWI's Quality Certification Program.

B. Installed Fire Rated Door and Transom Panel Assembly: Conform to NFPA 80 for fire rated class as indicated.

C. Blemishes and dents shall be cause for rejection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.8 FIELD CONDITIONS

A. Environmental Limitations: 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 ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Algoma Hardwoods, Inc.
2. Eggers Industries.
3. Mohawk Doors; a Masonite company.
4. Graham Flush Wood Doors.
5. Marshfield Door Systems.
~~3.~~6. VT Industries Architectural Wood Doors.
~~4.~~7. Acceptable Substitution: Refer to Section 01 60 00 “Product Requirements.”

B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
1. WDMA I.S.1-A Performance Grade: Heavy Duty, unless indicated otherwise.

B. Regional Materials: Flush wood doors shall be manufactured within 500 miles (800 km) of Project site.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are 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.
1. Pairs: Provide formed-steel edges and astragals with intumescent seals.
   a. Finish steel edges and astragals to match door hardware (locksets or exit devices).

D. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-2 made with binder containing no urea-formaldehyde.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
4. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
   a. Screw-Holding Capability: 550 lbf (2440 N) per WDMA T.M.-10.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors: Rated and non-fire rated.
   1. Grade: Premium, with Grade A faces.
   2. Species: Select white maple. Veneer shall be clear, free of all heartwood discoloration, color streaks and irregular figure coloration.
   3. Cut: Plain sliced (flat sliced).
   4. Match between Veneer Leaves: Book match.
   5. Assembly of Veneer Leaves on Door Faces: Running match.
   6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
   7. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet (3 m) or more.
   8. Exposed Vertical Edges: Same species as faces - edge Type A.
   9. Core: Particleboard.
   10. Construction: Five plies, bonded construction.

2.4 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: Flush rectangular beads.
   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- (1.2-mm-) thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.

C. Packaged Vision Lites with Integral Blinds: Lo-Profile Metal Vision Frame with Internal Mini-Blind; 20 gauge cold rolled steel frames, painted custom color to be selected by Architect, with mitered corners to fit 1 inch insulating tempered glass with integral white horizontal louver blinds.
   1. Anemostat Door Products (310) 325-7500; www.anemostat.com.
   2. Acceptable Substitution.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
   1. Clearances:
      a. Head and jamb: 1/8 inch.
      b. Bottom: 3/8 inch maximum to finished floor, 1/8 inch at thresholds.
      c. Meeting Stile: 1/8 inch.
   2. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
   1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
   2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. 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 and packaged vision lites in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."

2.6 FACTORY FINISHING

A. Factory finish doors.

B. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges and mortises.

C. Use only paints and coatings that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Transparent Finish:
   1. Grade: Premium.
   2. Finish: WDMA TR-6 catalyzed polyurethane.
   3. Staining: As selected by Architect from manufacturer's full range.
   4. Effect: Open-grain finish.
   5. 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. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
   1. Install fire-rated doors according to NFPA 80.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
   1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
      a. Comply with NFPA 80 for fire-rated doors.
   2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
   3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

E. Repair and refinish existing wood doors including "dutchmen" to accommodate new hardware.

F. Trim existing doors to clear finish flooring material where thickness of floor material changes.

3.3 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 31 13

ACCESS DOORS AND FRAMES

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. Access doors and frames for gypsum board construction, for walls and ceilings.
   2. Mechanical or Electrical equipment access doors shall be provided under Division 22/23 or Division 26 and installed by the trade responsible for the material in which the door is located.
   3. Furnish access doors indicated on Drawings for general access, to be installed by trade responsible for material in which door is located.

B. Related Requirements:
   1. Section 07 72 00 "Roof Accessories" for roof hatches.
   2. Section 08 71 00 “Door Hardware” for cylinder locks for access doors.
   3. Section 09 29 00 “Gypsum Board Assemblies” for installation of access doors and frames.
   4. Section 23 33 00 "Air Duct Accessories" for heating and air-conditioning duct access doors.

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
   1. Include construction details, fire ratings, materials, individual components and profiles, and finishes.

C. Shop Drawings:
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Detail fabrication and installation of access doors and frames for each type of substrate.

D. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.

E. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. NFPA 252 or UL 10B.

2.2 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Basis-of-Design Product: Model Numbers indicated below are as manufactured by Milcor Inc., A Hart & Cooley Inc. company. Subject to compliance with requirements, provide product indicated or a comparable product by one of the following:
   1. Acudor Products, Inc.
   2. Alfab, Inc.
   3. Babcock-Davis.
   4. J. L. Industries, Inc.; Div. of Activar Construction Products Group.

5. Larsen's Manufacturing Company.
6. MIFAB, Inc.

B. Source Limitations: Obtain access doors and frames from single source from single manufacturer.

C. Recessed Access Doors with Concealed Flanges:
1. Basis-of-Design Product: Milcor; "DWR."
2. Assembly Description: Fabricate door in the form of a pan recessed 5/8 inch (16 mm) for gypsum board infill. Provide frame with gypsum board bead for concealed flange installation.
3. Locations: Wall and ceiling.
4. Door Size: 16 inches by 16 inches, and as otherwise indicated.
5. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch (1.63 mm), 16 gage.
   a. Finish: Manufacturer's standard galvanizing process, with factory prime coat.
6. Frame Material: Same material, thickness and finish as door.
7. Hinges: Continuous piano hinge.
8. Hardware: Lock.

D. Fire-Rated, Flush Access Doors with Exposed Flanges:
1. Basis-of-Design Product: Milcor; "Fire Rated Access Door."
2. Assembly Description: Fabricate door to fit flush to frame, with a core of mineral-fiber insulation enclosed in sheet metal. Provide self-latching door with automatic closer and interior latch release. Provide manufacturer's standard-width exposed flange, proportional to door size.
3. Locations: Wall and ceiling.
4. Fire-Resistance Rating: Not less than that of adjacent construction.
1. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch (1.63 mm), 16 gage.
   a. Finish: Manufacturer's standard galvanizing process, with factory prime coat.
2. Frame Material: Same material, thickness and finish as door.
3. Hinges: Continuous piano hinge.
4. Hardware: Lock.

E. Hardware:
1. Lock: Cylinder.
   a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 08 71 00 "Door Hardware."

2.3 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

D. Frame Anchors: Same type as door face.

E. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.4 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 attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
2. Provide mounting holes in frames for attachment of units to metal framing.

D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.

E. Locks and Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
1. For cylinder locks, furnish two keys per lock and key all locks alike.
2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

2.5 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. Steel and Metallic-Coated-Steel Finishes:
1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

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.

B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 13

SECTION 08 33 23

OVERHEAD COILING DOORS

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. Service doors.
   2. Counter doors (shutters).
   3. Fire-rated service doors.
   4. Fire-rated counter doors.
   5. Electric motor operation, wiring from electric circuit disconnect to operator to control station.

B. Related Sections:
   1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports.
   2. Section 08 36 13 "Overhead Section Doors."

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design overhead coiling doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions, based on requirements of authorities having jurisdiction and design requirements indicated on the Drawings.
   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

C. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
   1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
   2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
   3. For fire-rated doors, description of fire-release system including testing and resetting instructions.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Show locations of replaceable fusible links.
   3. Wiring Diagrams: For power, signal, and control wiring.

D. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
   1. Include similar Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
   1. Curtain Slats: 12 inches (305 mm) long.
   2. Bottom Bar: 6 inches (150 mm) long with sensor edge.
   3. Guides: 6 inches (150 mm) long.
   4. Brackets: 6 inches (150 mm) square.
   5. Hood: 6 inches (150 mm) square.

F. Delegated-Design Submittal: For overhead coiling doors 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. Detail fabrication and assembly of seismic restraints.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Seismic Qualification Certificates: For overhead coiling doors, accessories, and components, from manufacturer.

C. Oversize Construction Certification: For door assemblies required to be fire-rated and that exceed size limitations of labeled assemblies.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
   1. Obtain operators and controls from overhead coiling door manufacturer.

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
   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. Smoke Control: In corridors, smoke barriers, acoustically-rated partitions, and where indicated, provide doors that are listed and labeled with the letter "S" on the fire-rating label by a qualified testing agency for smoke- and draft-control based on testing according to UL 1784; with maximum air-leakage rate of 3.0 cfm/sq. ft. (0.01524 cu. m/s x sq. m) of door opening at 0.10 inch wg (24.9 Pa) for both ambient and elevated temperature tests.

D. 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.

E. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:

1. Stainless-Steel Door Curtain Slats: ASTM A 666, Type 304; sheet thickness of 0.025 inch (0.64 mm) and as required to meet requirements.
2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face.

B. Endlocks: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.

C. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from stainless steel, with finish matching curtain slats.

D. Bottom Bar for Counter Doors: Manufacturer's standard continuous channel or tubular shape, fabricated from stainless steel, with finish matching curtain slats.

E. Astragal for Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.

F. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

G. Push/Pull Handles: For emergency-operation of doors, provide steel lifting handles on each side of door finished to match curtain.

2.2 HOOD

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head, including motor enclosure where motor occurs. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
1. Stainless Steel: 0.025-inch- (0.64-mm-) thick stainless-steel sheet, Type 304, complying with ASTM A 666.
2. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.

2.3 CURTAIN ACCESSORIES

A. Smoke Seals: Equip each fire-rated door with smoke-seal perimeter gaskets for smoke and draft control as required for door listing and labeling by a qualified testing agency.
1. Provide smoke-seal perimeter gaskets on all doors located in partitions with acoustical rating.

B. Automatic-Closing Device for Fire-Rated Doors: Equip each fire-rated door with an automatic-closing device that is inoperative during normal door operations and that has a governor unit complying with NFPA 80 and an easily tested.
1. Reset release mechanism designed to be activated by building fire-detection and -alarm systems and manufacturer's standard door-holder-release devices.
a. Fusible link release devices are not permitted.
2. Provide automatic resetting of closing system.

C. Take up reel mounted near the motor operator; self-coiling electrical cord to supply the electrical signal from the circuit of the sensing edge to the motor operator.

2.4 COUNTERBALANCING MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

2.5 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch,

remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Provide 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.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door Operator Location: Operator location indicated for each door.

1. Wall Mounted: Operator is mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.

D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 11 05 13 "Common Motor Requirements for Equipment" unless otherwise indicated.

1. Electrical Characteristics:
   a. Phase: Single phase.
   b. Volts: 115 V.
   c. Hertz: 60.
2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
3. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel. For fire-rated doors, activation delays closing.

1. Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
   a. Self-Monitoring Type: Four-wire configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Provide key-switch, three-position control station with controls labeled "Open," "Close," and "Stop."

1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

I. Emergency Operation Disconnect Device: Equip operator with 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.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

2.6 DOOR AND COUNTER DOOR ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide the Cornell Iron Works product described below, or comparable product by one of the following:
   1. Cookson Company.
   2. Overhead Door Corporation.
   3. Raynor.

B. Basis-of-Design Product: Cornell Iron Works, Service Doors – Model ESD10, and Counter Doors – Model ESC10.
   1. Operation Cycles: Not less than 20,000.
      a. Include tamperproof cycle counter.
   2. Door Curtain Slats: Flat profile stainless steel slats of 1-7/8-inch (48-mm) center-to-center height.
   3. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.
   4. Hood: Match curtain material and finish.
      a. Shape: Square.
      b. Mounting: Face of wall.
   5. Sill Configuration for Counter Door: No sill.
   6. Electric Door Operator:
      a. Usage Classification: Standard duty, up to 60 cycles per hour.
      b. Motor Exposure: Interior.
      c. Emergency Manual Operation: Push-up type.
      d. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar.
         1) Sensor Edge Bulb Color: Black.
      e. Remote-Control Station: Interior.
      f. Other Equipment: Audible and visual signals.
   7. Door Finish: Stainless steel No. 4 (polished directional satin).

2.7 FIRE-RATED DOOR AND COUNTER DOOR ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide the Cornell Iron Works product described below, or comparable product by one of the following:
   1. Cookson Company.
   2. Overhead Door Corporation.
   3. Raynor.

B. Basis-of-Design Product: Cornell Iron Works, SmokeShield Doors – Model ERD11, and SmokeShield Counter Fire Doors – Model ERC11.
   1. Fire Rating: As indicated on the Drawings, with smoke control.
   2. Operation Cycles: Not less than 20,000.
      a. Include tamperproof cycle counter.
   3. Door Curtain Slats: Flat profile stainless steel slats of 1-7/8-inch (48-mm) center-to-center height.
   4. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.
   5. Hood: Match curtain material and finish.
      a. Shape: Square.
      b. Mounting: Face of wall.
   6. Sill Configuration for Counter Door: No sill.
   7. Electric Door Operator:
      a. Usage Classification: Standard duty, up to 60 cycles per hour.
      b. Motor Exposure: Interior.
      c. Emergency Manual Operation: Push-up type.
      d. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar.
         1) Sensor Edge Bulb Color: Black.
      e. Remote-Control Station: Interior.
      f. Other Equipment: Audible and visual signals.

8. Door Finish: Stainless steel No. 4 (polished directional satin).
9. Fire door operation: M100 FireGard.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

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.

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 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.
3. Directional Satin Finish: No. 4.

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. Examine locations of electrical connections.

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

3.2 INSTALLATION

A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.

C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Fire-Rated Doors: Install according to NFPA 80.

E. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.

3.3 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
1. Perform installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
3. Test door closing when activated by detector or alarm-connected fire-release system. Reset door-closing mechanism after successful test.

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 seals to provide weathertight fit around entire perimeter.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

SECTION 08 36 13

SECTIONAL DOORS

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. Electrically operated, interior, fully-glazed, aluminum sectional overhead doors.
   2. Electrically operated, exterior, insulated steel sectional overhead doors.

B. Related Sections:
   1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports.
   2. Section 08 71 00 "Door Hardware."

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Delegated Design: Design sectional doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
   1. Wind Loads: As indicated on Drawings.
   2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.

D. Operability under Wind Load: Design overhead coiling doors to remain operable under design wind load, acting inward and outward.

E. Air Infiltration, Exterior Doors: Maximum rate not more than indicated when tested according to ASTM E 283.
   1. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. (0.406 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h).

F. Seismic Performance: Sectional doors shall withstand the effects of earthquake motions, based on requirements of authorities having jurisdiction and design requirements indicated on the Drawings.
   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

G. Operation Cycles: Provide sectional door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type and size of sectional door and accessory. Include the following:
   1. Construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
   2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.

D. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
   1. Include similar Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Flat Door Sections: 6 inches (150 mm) square.
   2. Frame for Paneled Door Sections: 6 inches (150 mm) long of each width of stile and rail required.
   3. Panel for Raised-Panel Door Sections: 12 inches (300 mm) square at panel corner, but not smaller than required to show raised-panel profile.

F. Delegated-Design Submittal: For sectional doors 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. Detail fabrication and assembly of seismic restraints.
   2. Summary of forces and loads on walls and jambs.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Seismic Qualification Certificates: For sectional doors, accessories, and components, from manufacturer.

C. Warranties: Sample of special warranties.

D. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Wood Door Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

C. Source Limitations: Obtain sectional doors from single source from single manufacturer.
   1. Obtain operators and controls from sectional door manufacturer.

D. 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.

E. Standard for Sectional Doors: Fabricate sectional doors to comply with DASMA 102 unless otherwise indicated.

F. Regulatory Requirements:
   1. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1.
   2. Comply with requirements of authorities having jurisdiction for safety glazing in sectional doors.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which 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. Faulty operation of hardware.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
      d. Delamination of exterior or interior facing materials.
      e. Electric motor malfunction/non-operation.
   2. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which 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 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Fabricate from zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated zinc coating and thickness.
   1. Fabricate section faces from single sheets to provide sections not more than 24 inches (610 mm) high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weathertight seal, with a reinforcing flange return.
   2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

B. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.064-inch- (1.63-mm-) nominal coated thickness and welded to door section. Provide intermediate stiles formed from not less than 0.064-inch- (1.63-mm-) thick galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches (1219 mm) apart.

C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal.

D. Reinforce sections with continuous 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.

E. Provide reinforcement for hardware attachment.

F. Foamed-in-Place Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polyurethane insulation, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load, and with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within steel sections that incorporate the following interior facing material, with no exposed insulation:
   1. Interior Facing Material: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated thickness.

G. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

H. Windows: Window units of type and size indicated and in arrangement shown. Set insulating glass units in manufacturer’s standard vinyl, rubber, or neoprene glazing channel. Provide removable stops of same material as door-section frames.
   1. Insulating Glass: Manufacturer's standard double-pane tempered glass units.

2.2 ALUMINUM DOOR SECTIONS

A. Sections: Construct door sections with stiles and rails formed from extruded-aluminum shapes, complying with ASTM B 221 (ASTM B 221M), alloy and temper recommended by manufacturer for type of use and finish indicated, with wall thickness not less than 0.065 inch (1.7 mm) for door section 1-3/4 inches (44 mm) deep. Fabricate sections with stile and rail dimensions and profiles shown on Drawings. Join stiles and rails by welding or with concealed, 1/4-inch- (6-mm-) minimum diameter, aluminum or nonmagnetic stainless-steel through bolts, full height of door section. Form meeting rails to provide a weathertight-seal joint.
   1. Provide reinforcement for hardware attachment.

B. Full-Vision: Manufacturer's standard, tubular, aluminum-framed sections fully glazed with insulating glass units set in manufacturer's standard vinyl, rubber, or neoprene glazing channel and with removable extruded-aluminum stops.
   1. Insulating Glass: Manufacturer's standard double-pane tempered glass units.

2.3 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
   1. Comply with NFPA 70.
   2. Provide 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.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.
   1. Trolley: Trolley operator mounted to ceiling above and to rear of door in raised position and directly connected to door with drawbar.

D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Section 11 05 13 "Common Motor Requirements for Equipment" unless otherwise indicated.
   1. Electrical Characteristics:
      a. Phase: Single phase.
      b. Volts: 115 V.
      c. Hertz: 60.
   2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
   3. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
   4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
   5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
   1. Photoelectric Sensor at exterior steel doors: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.

a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensor device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.

2. Sensor Edge at interior aluminum doors: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
   a. Self-Monitoring Type: Four-wire configured device designed to interface with door-operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Provide key-switch, three-position control station with controls labeled "Open," "Close," and "Stop."
   1. Operation from the interior only.
      a. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

I. Emergency Operation Disconnect Device: Equip operator with 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.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

2.4 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances shown on Drawings, and complying with ASTM A 653/A 653M for minimum G60 (Z180) zinc coating. Provide complete track assembly including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type and size. Slot vertical sections of track spaced 2 inches (51 mm) apart for door-drop safety device. Slope tracks at proper angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
   1. Coordinate track height with finished ceilings, where appropriate.

B. Track Reinforcement and Supports: Galvanized-steel track reinforcement and support members, complying with ASTM A 36/A 36M and ASTM A 123/A 123M. Secure, reinforce, and support tracks as required for door size and weight to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.
   1. Vertical Track Assembly: Track with wall jamb brackets attached to track and attached to wall.
   2. Horizontal Track Assembly: Track with continuous reinforcing angle attached to track and supported at points from curve in track to end of track by laterally braced attachments to overhead structural members.

C. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

2.5 HARDWARE

A. General: Provide heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch- (2.01-mm-) nominal coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. 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 not possible. Provide double-end hinges where required, for doors over 16 feet (4.88 m) wide unless otherwise recommended by door manufacturer.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch- (76-mm-) diameter roller tires for 3-inch- (76-mm-) wide track and 2-inch- (51-mm-) diameter roller tires for 2-inch- (51-mm-) wide track.

D. Push/Pull Handles: For push-up or emergency-operated doors, provide lifting handles on each side of door.

2.6 LOCKING DEVICES

A. For Steel Doors: Fabricate with cylinder lock, spring-loaded deadbolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
   1. Lock Cylinders: Provide cylinders specified in Section 08 71 00 "Door Hardware".
   2. Keys: Two for each cylinder.

B. For Aluminum Doors: Motor operator integral gearing for locking door.

2.7 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Weight Counterbalance: Counterbalance mechanism consisting of filled pipe weights that move vertically in a galvanized-steel weight pipe. Connect pipe weights with cable to weight-cable drums mounted on torsion shaft made of steel tube or solid steel.

C. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one additional midpoint bracket for shafts up to 16 feet (4.88 m) long and two additional brackets at one-third points to support shafts more than 16 feet (4.88 m) long unless closer spacing is recommended by door manufacturer.

D. Cables: Galvanized-steel lifting cables with cable safety factor of at least 7 to 1.

E. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

F. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

G. Provide a spring bumper at each horizontal track to cushion door at end of opening operation.

2.8 STEEL DOOR ASSEMBLY – FOR EXTERIOR USE

A. Manufacturers: Subject to compliance with requirements, provide the Raynor product described below, or comparable product by one of the following:
   1. Overhead Door Corporation.
   2. Wayne-Dalton Corp.

B. Basis-of-Design Product: Raynor, TM 175-20 Thermal Sectional Doors.
   1. Operation Cycles: Not less than 20,000.
   2. R-Value: 16.
   3. Steel Sections: Zinc-coated (galvanized) steel sheet with G90 (Z275) zinc coating.
      a. Section Thickness: 2 inches (51 mm).
      b. Exterior-Face, Steel Sheet Thickness: 20 gauge minimum thickness.
         1) Surface: Manufacturer's standard, grooved.
      c. Insulation: Foamed in place.
      d. Interior Facing Material: Zinc-coated (galvanized) steel sheet of 26 gauge minimum thickness.
   4. Track Configuration: Standard-lift track.

5. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.
6. Windows: Fully-glazed section as indicated on Drawings; at height indicated on Drawings; glazed with insulated glass units.
7. Roller-Tire Material: Manufacturer's standard.
8. Counterbalance Type: Torsion spring.
9. Electric Door Operator:
    a. Usage Classification: Standard duty, up to 60 cycles per hour.
    b. Motor Exposure: Interior, clean, and dry.
    c. Emergency Manual Operation: Push-up type.
    d. Obstruction-Detection Device: Automatic photoelectric sensor.
    e. Remote-Control Station: Interior.
10. Door Finish:
    a. Baked-Enamel or Powder-Coated Finish: Color and gloss as selected by Architect from manufacturer's full range of not less than 150 colors.
    b. Finish of Interior Facing Material: Match finish of exterior section face.

2.9 ALUMINUM DOOR ASSEMBLY – FOR INTERIOR USE

A. Manufacturers: Subject to compliance with requirements, provide the Raynor product described below, or comparable product by one of the following:
1. Overhead Door Corporation.
2. Wayne-Dalton Corp.

B. Basis-of-Design Product: Raynor, AlumaView Sectional Rail & Stile Doors.
1. Operation Cycles: Not less than 20,000.
2. Aluminum Sections: Full vision.
    a. Section Thickness: 1 3/4 inches.
    b. Insulating Glass: Manufacturer's standard double-pane glass units.
3. Track Configuration: Standard-lift track.
4. Weatherseals: Fitted to bottom and top and around entire perimeter of door.
5. Roller-Tire Material: Manufacturer's standard.
6. Counterbalance Type: Torsion spring.
7. Electric Door Operator:
    a. Usage Classification: Standard duty, up to 60 cycles per hour.
    b. Motor Exposure: Interior, clean, and dry.
    c. Emergency Manual Operation: Push-up type.
    d. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar.
    e. Remote-Control Station: Interior.
8. Door Finish:
    a. Baked-Enamel or Powder-Coated Finish: Color and gloss as selected by Architect from manufacturer's full range of not less than 150 colors.

2.10 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

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.

2.11 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603. Comply with coating manufacturer's written instructions for cleaning, conversion coating, application, and baking.

2.12 STEEL FINISHES

A. Baked-Enamel or 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.

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. Examine locations of electrical connections.

C. 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; according to manufacturer's written instructions and as specified.

B. Tracks:
   1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches (610 mm) 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.
   3. Repair galvanized coating on tracks according to ASTM A 780.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Test and adjust controls and safeties. 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 weathertight fit around entire perimeter.

D. Align and adjust motors, pulleys, belts, sprockets, chains, and controls according to manufacturer's written instructions.

E. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780.

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 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. Exterior and interior storefront framing and glazing.
      a. Storefront framing for window walls.
   2. Extruded aluminum metal trim, and plastic pocket fillers.
   3. Sheet metal flashing and trim associated with aluminum-framed entrance and storefront systems and required for a complete, watertight installation.
   4. Weatherstripping.
   5. Perimeter sealant.

B. Related Requirements:
   1. Section 07 92 00 "Joint Sealants."
   2. Section 08 80 00 "Glazing."

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: For aluminum-framed storefronts and window 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 vertical-to-horizontal intersection of aluminum-framed storefronts and window 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.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

F. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch (300-mm) 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.

G. Delegated-Design Submittal: For aluminum-framed entrances and storefronts 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. Product Certification: Product grade and manufacturer AAMA certification.

B. Installer Certification.

C. Product Test Reports: For tests performed by a qualified testing agency.

D. Quality-Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C 1401. Include periodic quality-control reports.

E. Source quality-control reports.

F. Field quality-control reports.

G. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

B. Documentation of Training: Include for following.
1. Date of training.
2. Sign-up sheet for people being instructed.
3. Outline of training provided.

1.7 QUALITY ASSURANCE

A. Single Source Responsibility: Provide aluminum-framed entrances and storefront systems from one source and a single manufacturer.

B. Manufacturer Qualifications: A firm with not less than five years experience manufacturing commercial windows on similar projects, and a five year ~~with a~~ record of successful in-service performance for the specific products to be utilized for this project.

C. Certified Products: Provide products classified as AW grade and listed in the AAMA Certified Products Directory.

D. Installer Qualifications:
1. An entity that employs installers and supervisors who are trained and approved by manufacturer.
2. Minimum five years experience installing commercial windows on similar projects, with a record of successful in-service performance.

E. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.

F. 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.

G. Coordinate with installation of other components that comprise the exterior enclosure.

H. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

I. Design Wind Loads: Comply with requirements of International Building code, and not less than 30 lbs/sf (100 mph).

J. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

K. Conform to requirements of ANSI A117.1 and the current ADAAG.

1.8 MOCKUPS

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Per Section 01 40 00, an entire mockup wall assembly including masonry, storefront system, flashings, copings, metal wall panels, insulation, glazing, sealants, etc. will be required for review by Architect before proceeding with Work.
   2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
   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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.
   1. Deliver components in original manufacturers protective packaging.
   2. Store in clean, dry location.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

C. Scratches, mars, blemishes and dents will be cause for rejection.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to meet performance requirements.
      b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
      c. Noise or vibration created by wind and thermal and structural movements.
      d. Faulty operation of movable sash and hardware.
      e. Deterioration of materials and finishes beyond normal weathering.
      f. Water penetration through fixed glazing and framing areas.
      g. Failure of operating components.
      h. Failure of insulating glass.
         1) Failure of insulating glass units shall include, but not be limited to, failure of glass seal, and interpane dusting or misting.
   2. Warranty Period:
      a. Entire Aluminum-Framed Entrance and Storefront system: Five years from date of substantial completion.
      b. Insulating Glass Units: 10 years from date of substantial completion.
      c. Aluminum Finish: ~~20~~ 10 years from date of substantial completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Comply with AAMA/WDMA 101/i.s.2/NAFS.
   2. Aluminum-framed entrances and storefronts 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.
   3. 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.

B. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
1. Design Wind Loads: Comply with requirements of IBC, 90 mph fastest mile speed, 110 mph 3 second gusts, Exposure C. Basic wind speed = 110 mph.
2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

C. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

D. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sf of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.

E. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 6.24 lbf/sf.

F. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

G. Expansion and Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 180 degrees F over a 12 hour period without buckling, failure of joint seals, permanent deformation of framing, flashing and components, and without causing detrimental effect to glass, system components, anchorages, and other building elements.

H. Design Wind Loads: Comply with requirements of International Building code, 30 lbs/sf (100 mph).

I. Allow for building deflection at storefront heads.

2.2 MANUFACTURERS

A. Basis of Design: Subject to compliance with requirements, provide “451UT" by Kawneer North America, or comparable product by one of the following:
1. Manko.
2. Tubelite.

B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on four sides.
a. Glazing installation from the building interior.
3. Glazing Plane: Center.
4. Finish: Clear anodic finish.
5. Fabrication Method: Field-fabricated stick system.
6. Application: All locations, unless noted otherwise.

B. Framing at the Greenhouse: Provide heavy duty mullions at the Greenhouse for attachment of glass shelving.
1. Kawneer 452-CG-112 with 450-110 steel reinforcing.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
    a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
    b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
    c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
    d. Structural Profiles: ASTM B 308/B 308M.
2. Steel Reinforcement: 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 according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
    a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
    b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
    c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 INSULATED SPANDREL PANELS

A. Insulated Spandrel Panels: Laminated, metal-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.
1. Overall Panel Thickness: 1 inch (25.4 mm).
2. Exterior Skin: Aluminum.
    a. Thickness: Manufacturer's standard for finish and texture indicated.
    b. Finish: Match framing system.
    c. Texture: Embossed.
    d. Backing Sheet: 0.157-inch- (4-mm-) thick, cement board.
3. Interior Skin: Aluminum.
    a. Thickness: Manufacturer's standard for finish and texture indicated.
    b. Finish: Matching storefront framing.
    c. Texture: Embossed.
    d. Backing Sheet: 0.157-inch- (4-mm-) thick, cement board.
4. Thermal Insulation Core: Manufacturer's standard rigid, closed-cell, polyisocyanurate board.

B. Surface-Burning Characteristics: Comply with ASTM E 84; 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.

C. Manufacturers: Mapes "R" or Acceptable Substitution.

2.5 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Kawneer "Heavywall" or Acceptable Substitution.
2. Door Design: Wide stile; 5-inch (127-mm) 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.

2.6 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 D 2000, molded neoprene, or ASTM D 2287, 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.

2.7 GLASS AND GLAZING

A. Glazing: Comply with Section 08 80 00 "Glazing."

2.8 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.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) 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 A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing:
   ~~C.~~1. Extruded aluminum flashing, compatible with adjacent materials.
      ~~1.~~a. Provide thermally-broken sill flashing Kawneer 451T-037, or comparable product.

D. Provide all required prefinished 0.032 inch thick brake metal trim to span masonry cavities, space between studs and veneer, etc., to create a finished installation matching the storefront system, whether or not shown on Drawings.

~~D.~~E. Minimally Expanding Spray Foam: Hilti "CF 812", or Acceptable Substitution.

~~E.~~F. Plastic Back-Closures: Provide plastic pocket fillers at perimeter of framing for installation of minimal expanding spray foam.

~~F.~~G. Provide conduits internal to the frames when electrified hardware and/or security devices are indicated.

~~G.~~H. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.9 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 interior for vision glass and exterior for spandrel glazing or metal panels.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible. Use of exposed fasteners is cause for rejection and replacement at no cost to Owner.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Storefront Framing: Fabricate components for assembly using thermally-broken head-and-sill-receptor system with shear blocks at intermediate horizontal members.

F. Provide internal drainage of glazing spaces to exterior through weep holes. End dams required.

G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.10 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker, unless otherwise indicated.

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

A. General:
   1. Comply with manufacturer's written instructions and AAMA - Metal Curtain Wall, Window Storefront and Entrance - Guide Specification Manual.
   2. Do not install damaged components.
   3. Fit joints to produce hairline joints free of burrs and distortion.
   4. Rigidly secure nonmovement joints.
   5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
   6. Seal perimeter and other joints watertight unless otherwise indicated.
   7. Install expanding foam insulation:
      a. Install plastic pocket fillers at back of aluminum framing profile, at perimeter of storefront framing assembly, to prevent foam from entering frames.
      b. Install minimal expanding foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal/air barrier.

B. 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.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 08 80 00 "Glazing."

G. Install weatherseal sealant according to Section 07 92 00 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

H. Install perimeter sealants according to Section 07 92 00 “Joint Sealants” and according to manufacturer’s written instructions.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
   2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
   3. Alignment:

a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).

4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

3.4 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
a. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.

C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove protective material from pre-finished aluminum surfaces. Continue to protect exposed portions of factory finished aluminum surfaces from damage by work of other trades. Any member which has a damaged surface shall be removed and replaced at no cost to Owner.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect installed products from damage during subsequent construction.

E. Remove and replace glazing that is broken, chipped, cracked, abraded or damaged in any way, including natural causes, accidents and vandalism during construction period.

END OF SECTION 08 41 13

SECTION 08 44 13

GLAZED ALUMINUM CURTAIN WALLS

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. Glazed aluminum curtain walls.
2. Solid, insulated infill panels.
3. Extruded aluminum trim and plastic pocket fillers.
4. Sheet metal flashing and trim associated with aluminum-framed entrance and storefront systems and required for a complete, watertight installation.
5. Perimeter sealant.

B. Related Requirements:
1. Section 01 91 15 “Facility Enclosure Commissioning” for commissioning requirements that may affect this section.
~~1.~~2. Section 07 92 00 "Joint Sealants."
~~2.~~3. Section 08 41 13 "Aluminum Storefronts and Entrances."
~~3.~~4. Section 08 80 00 "Glazing."

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 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 glazed aluminum 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 vertical-to-horizontal intersection of glazed aluminum 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 (300-mm) 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 glazed aluminum curtain walls 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. Product Certification: Product grade and manufacturer AAMA certification.

B. Installer Certification.

C. Product Test Reports: For glazed aluminum curtain walls, for tests performed by a qualified testing agency.

D. Quality-Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C 1401. Include periodic quality-control reports.

E. Source quality-control reports.

F. Field quality-control reports.

G. Sample Warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For glazed aluminum curtain walls to include in maintenance manuals.

B. Documentation of Training: Include for following.
   1. Date of training.
   2. Sign-up sheet for people being instructed.
   3. Outline of training provided.

1.7 QUALITY ASSURANCE

A. Certified Products: Provide products classified as AW grade and listed in the AAMA Certified Products Directory.

B. Single Source Responsibility: Provide curtainwall system and storefront system (described in Section 08 41 13 Aluminum-Framed Entrances and Storefronts), produced by a single manufacturer.
   1. Glazing for aluminum curtainwall (Section 08 44 13) and storefront system (Section 08 41 13), shall be purchased from one manufacturer having single source responsibility.

C. Installer Qualifications:
   1. An entity that employs installers and supervisors who are trained and approved by manufacturer.
   2. Minimum five years experience installing commercial windows on similar projects.
      a. Provide building address and contact information for three successfully completed school projects.

D. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.

E. 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.

F. Coordinate with installation of other components that comprise the exterior enclosure.

G. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

H. Design Wind Loads: Comply with requirements of International Building code, and not less than 30 lbs/sf (100 mph).

I. Allow for building deflection at attachment to structure.

J. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.8 MOCKUPS

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Per Section 01 40 00, an integrated exterior wall mockup assembly including masonry, curtainwall system, flashings, copings, metal wall panels, insulation, glazing, sealants, etc. will be required for review by Architect before proceeding with Work.
   2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
   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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

C. Scratches, mars, blemishes and dents will be cause for rejection.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to meet performance requirements.
      b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
      c. Noise or vibration created by wind and thermal and structural movements.
      d. Faulty operation of movable sash and hardware.
      e. Deterioration of materials and finishes beyond normal weathering.
      f. Water penetration through fixed glazing and framing areas.
      g. Failure of operating components.
      h. Failure of insulating glass.
         1) Failure of insulating glass units shall include, but not be limited to, failure of glass seal, and interpane dusting or misting.
   2. Warranty Period:
      a. Entire Glazed Aluminum Curtain Wall system: Five years from date of final acceptance of the project.
      b. Insulating Glass Units: 10 years from date of final acceptance of the project.
      c. Aluminum Finish: 20 years from date of final acceptance of the project.

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 glazed aluminum curtain walls.

B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Glazed aluminum 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: Comply with IBC, and as indicated.

D. Deflection of Framing Members: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

E. Structural: Test according to ASTM E 330 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. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
1. Fixed Framing and Glass Area:
a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure.

H. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure.
2. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

I. Interstory Drift: Accommodate movement between curtainwall and structural framing without damage to components or deterioration of seals.

J. Seismic Performance: Glazed aluminum curtain walls shall withstand the effects of earthquake motions determined according to IBC and ASCE/SEI 7.
1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement and 1.5 times the design displacement.
2. Vertical Interstory Movement: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.7 at design displacement and 1.5 times the design displacement.

K. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.

2.2 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide “1600UT System 1” by Kawneer North America, or comparable product by one of the following:
1. Manko.
2. Tubelite.

B. Source Limitations: Obtain all components of curtain wall system and products for Section 08 41 13 “Aluminum-Framed Entrances and Storefronts,” including framing, spandrel panels, and accessories, from single manufacturer.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   1. Construction: Thermally broken.
   2. Glazing System: Retained mechanically with gaskets on four sides.
   3. Glazing Plane: Front.
   4. Finish: Clear anodic finish.
   5. Fabrication Method: Field-fabricated stick system.

B. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
   1. Include snap-on aluminum trim that conceals fasteners.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Materials:
   1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
      a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
      b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
      c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
      d. Structural Profiles: ASTM B 308/B 308M.
   2. Steel Reinforcement: 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 according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
      a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
      b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
      c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

~~2.4 INSULATED SPANDREL PANELS~~

~~A. Insulated Spandrel Panels: Laminated, metal-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.~~
~~1. Overall Panel Thickness: 1 inch (25.4 mm).~~
~~2. Exterior Skin: Aluminum.~~
~~a. Thickness: Manufacturer's standard for finish and texture indicated.~~
~~b. Finish: Match framing system.~~
~~c. Texture: Embossed.~~
~~d. Backing Sheet: 0.157-inch- (4-mm-) thick, cement board.~~
~~3. Interior Skin: Aluminum.~~
~~a. Thickness: Manufacturer's standard for finish and texture indicated.~~
~~b. Finish: Matching curtain-wall framing.~~
~~c. Texture: Embossed.~~
~~d. Backing Sheet: 0.157-inch- (4-mm-) thick, cement board.~~
~~4. Thermal Insulation Core: Manufacturer's standard rigid, closed-cell, polyisocyanurate board.~~

~~B. Surface-Burning Characteristics: Comply with ASTM E 84; 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.~~

~~C. Products: Mapes "R" or Acceptable Substitution.~~

~~2.5~~2.4 GLAZING

A. Glass and Glazing: Comply with Section 08 80 00 "Glazing."

~~2.6~~2.5 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.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) 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 A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
1. Extruded aluminum sill flashing, compatible with adjacent materials

D. Provide all required prefinished extruded aluminum trim to span masonry cavities, space between studs and veneer, etc., to create a finished installation matching the curtainwall system, whether or not shown on Drawings.

~~D.~~E. Minimally Expanding Spray Foam: Hilti "CF 812", or Acceptable Substitution.

~~E.~~F. Plastic Back-Closures: Provide plastic pocket fillers at perimeter of framing for installation of minimal expanding spray foam.

~~F.~~G. Provide conduits internal to the frames when electrified hardware and/or security devices are indicated.

~~G.~~H. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

~~2.7~~2.6 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 interior for vision glass and exterior for spandrel glazing or metal panels.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible. Use of exposed fasteners is cause for rejection and replacement at no cost to Owner.
7. Components curved to indicated radii.

D. Fabricate components to resist water penetration as follows:
1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

E. Curtain-Wall Framing: Fabricate components for assembly using double-thermally-broken head-and-sill-receptor system with shear blocks at intermediate horizontal members ~~manufacturer's standard assembly method~~.

F. Provide internal drainage of glazing spaces to exterior through weep holes. End dams required.

G. After fabrication, clearly mark components on faces to remain concealed to view to identify their locations in Project according to Shop Drawings.

~~2.8~~2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

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 PREPARATION

A. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
7. Seal joints watertight unless otherwise indicated.
8. Install plastic pocket fillers in curtain wall to prevent foam from entering frames. Install minimal expanding foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal/air barrier.

B. 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 concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 08 80 00 "Glazing."
1. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

G. Install weatherseal sealant according to Section 07 92 00 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

3.4 ERECTION TOLERANCES

A. Erection Tolerances: Install glazed aluminum curtain walls to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
3. Alignment:

a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).

4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

3.5 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Perform the following test on mockups and representative areas of glazed aluminum curtain walls.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
a. Perform tests in each test area as directed by Architect. Perform at least three tests.

C. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove protective material from pre-finished aluminum surfaces. Continue to protect exposed portions of factory finished aluminum surfaces from damage by work of other trades. Any member which has a damaged surface shall be removed and replaced at no cost to Owner.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect installed products from damage during subsequent construction.

E. Remove and replace glazing that is broken, chipped, cracked, abraded or damaged in any way, including natural causes, accidents and vandalism during construction period.

END OF SECTION 08 44 13

SECTION 08 45 00

TRANSLUCENT SANDWICH PANEL WALL SYSTEM

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.

1.2 SUMMARY

A. Section includes:
   1. Insulated sandwich panels with translucent fiberglass skins separated by an aluminum grid.
   2. Metal framing for installation of sandwich panels.
   3. Sheet metal flashing and trim associated with panel wall system and required for a complete, watertight installation.
   4. Installation accessories.

B. Related Requirements:
   1. Section 07 92 00 "Joint Sealants" for perimeter sealant and back-up materials.

1.3 SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Qualification Certificates: manufacturer and installer.

C. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, panel configuration and internal drainage details.

D. Design Data: Provide framing member structural and physical characteristics, calculations, dimensional limitations.

E. Shop Drawings: Indicate system dimensions, including interior dividers, framed opening requirements and tolerance, anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding requirements.

F. Structural Analysis: Report on structural analysis of translucent sandwich panel wall system confirming compliance with requirements and signed and sealed by a professional engineer.

G. Product Test Reports: Submit substantiating engineering data, test results of previous test by independent laboratory which purport or meet performance criteria, and other supportive data.

H. Installation Data: Special installation requirements.

I. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with AAMA CW-DG-1.

B. Manufacturer Qualifications: Record of continuous manufacture of products specified for not less than 10 years.

C. Installer Qualifications: Company specializing in performing the Work of this section with minimum five (5) years successful completion of projects of similar size and type.

D. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA-CW-10.

B. Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.

C. Store panels on long edge, several inches above the ground, blocked and under cover to prevent warping.

1.6 WARRANTY

A. Special Warranty: Repair or replace Work that is defective, or non-performing, for a period of 5 years from the date of Substantial Completion, including the following.
   1. Panels:
      a. Color change.
      b. Delamination.
      c. Fiber exposure (fiber bloom).
   2. Finish:
      a. Color fade or change.
      b. Chipping.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with AAMA/WDMA 101/i.s.2/NAFS.

B. System Design: Design and size components to withstand dead loads and live loads caused by snow, hail, and positive and negative wind loads acting on panels, without damage or permanent set.
   1. Design Loads: Calculate in accordance with IBC.
   2. Design Wind Loads: Comply with requirements of IBC, 90 mph wind, 3 second gusts, Exposure C, Occupancy Category IV.
   3. Measure performance in accordance with ASTM E 330, using test load 1.5 times the design wind pressure and 10 second duration for maximum load.

C. Deflection: Limit mullion deflection to ¾ inch with full recovery of glazing materials.

D. System Assembly: Accommodate without damage to system, components, or deterioration of seals: movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; deflection of structural support framing and tolerance of supporting components.

E. Thermal Resistance of Panel System: U=0.23.

F. Light Transmittance of Panel System: 30%.

G. Air Infiltration: Limit air infiltration through assembly to 0.01 cu ft/min/sf of glazed area, measured at a reference differential pressure across assembly of 6.24 psf, as measured in accordance with ASTM E 283.

H. Water leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 15.00 lb/sf.

I. Expansion/Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect on system performance or components.

J. System Internal Drainage: Drain water entering joints, condensation occurring in framing system, or migrating moisture occurring within system, to the exterior by a weep drainage network.

K. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

2.2 MANUFACTURERS

A. Basis of Design: Subject to compliance with requirements, provide products manufactured by Kalwall Corporation: www.kalwall.com.
   1. "Major Industries" is an acceptable manufacturer, provided this manufacturer can demonstrate the performance characteristics precisely match or exceed the performance characteristics of the specified manufacturer.

1. Manufacturers who have submitted a substitution request for a polycarbonate- based translucent wall system as an equal to the specified translucent sandwich panel wall system should submit their pricing under Alternate No. 24. Manufacturers who have submitted substitution requests and are approved to provide alternative pricing:
   ~~A.~~a. Duo-Gard.

~~1. No substitutions.~~

2.3 MATERIALS - GENERAL

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B 209 (ASTM B209M).

C. Fasteners: Stainless Steel.

D. Miscellaneous: attachments and shims required for a complete installation.

2.4 COMPONENTS

A. Panels: Translucent fiberglass faces bonded to both sides of structural extruded aluminum grid, with exposed surfaces of exterior sheet chemically and permanently treated to protect against surface erosion and extreme weather conditions.
   1. Sandwich panel thickness: 2 ¾ inch.
   2. Panel Size: As indicated.
   3. Facing sheets: opaque.
   4. Color: “Crystal”.

B. Installation Channels: Extruded aluminum thermally-broken channels and batten framing to provide jamb, head, sill, and mullion installation framing.

C. Weather Seals: To suit application; non-bleeding; non-staining.

D. Fasteners: As recommended by manufacturer.

2.5 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure System: Thermally-broken extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.

B. Sealing Tape: Manufacturer’s standard, pre-applied to closure system at factory under controlled conditions.

C. Fasteners: 300 series stainless steel screws.

2.6 SEALANT MATERIALS

A. Sealant and backing materials: as specified in Section 07 92 00 – Joint Sealants.

2.7 FABRICATION

A. Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Make joints flush, hairline and waterproof.

C. Fabricate anchors and prepare components to receive anchoring devices.

D. Arrange fasteners and attachments to ensure concealment from view.

E. Reinforce framing members for external imposed loads.

2.8 FINISHES

A. Finish Coatings: Conform to AAMA 611.

B. Exposed Aluminum Surfaces:
   1. Clear anodic.

C. Apply one coat of bituminous paint to concealed aluminum and steel in contact with cementitous or dissimilar materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify dimensions, tolerances and method of attachment with manufacturer instructions.

B. Verify wall openings and adjoining air barrier and vapor retarder materials are installed and ready to receive work of this section.

3.2 INSTALLATION

A. Install translucent wall panel system in accordance with manufacturer instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances.

C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent Work.

D. Install sill flashings.

E. Install minimally expanding spray foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Install perimeter sealant, backing materials in accordance with Section 07 92 00 – Joint Sealants.

3.3 TOLERANCES

A. Maximum Variance from Plumb: 0.06 inches every 3 ft non-cumulative, or 0.5 inches per 100 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in a Plane: 1/32 inch.

C. Sealant Space Between Panel System Members and Adjacent Construction: maximum of ¾ inch and minimum of ¼ inch.

3.4 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Perform the following test on representative areas of sandwich panel wall system.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
    a. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.

C. Sandwich panel wall system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Remove protective material from prefinished aluminum surfaces. Continue to protect from damage by work of other trades. Any member which is damaged or has a damaged surface shall be removed and replaced at no cost to Owner.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surface clean.

C. Remove excess sealant by means acceptable to sealant manufacturer.

D. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.6 PROTECTION

A. Protect finished work from damage.

END OF SECTION 08 45 00

SECTION 08 62 00

UNIT SKYLIGHTS

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. Rectangular skylights.
   2. Tubular skylights.

B. Related Requirements:
   1. Section 01 23 00 “Alternates” for Bid Alternates that may affect this section.
   2. Section 07 54 23 “Thermoplasitc Polyolefin (TPO) Membrane Roofing for coordination of roofing performance.
   3. Section 07 72 00 “Roof Accessories” for requirements for prefabricated roof curbs.
   4. Section 08 45 00 "Translucent Sandwich Panel Wall Systems.”

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of unit skylight.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for unit skylights.

C. Shop Drawings:
   1. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.

D. Aluminum Finish Samples: For each type of exposed finish required, in a representative section/profile, in manufacturer's standard size.

E. Glazing Samples: For each color and finish of glazing indicated, 12 inches (300 mm) square and of same thickness indicated for the final Work.

F. Product Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Test Reports: For each type and size of unit skylight, for tests performed within the last four years by a qualified testing agency. Test results based on testing of smaller unit skylights than specified will not be accepted.

C. Field quality-control reports.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For unit skylights to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating unit skylights that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations, and minimum of ten years demonstrated successful completion of projects similar to the work indicated.

B. Installer Qualifications: An installer acceptable to unit skylight manufacturer for installation of units required for this Project, and minimum of three years demonstrated successful completion of projects similar to the work indicated.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Uncontrolled water leakage.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      c. Yellowing of acrylic glazing.
      d. Breakage of polycarbonate glazing.
   2. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL

A. Comply with AAMA/WDMA 101/i.s.2/NAFS.
   1. Provide certification label on products that indicate compliance with requirements of the local jurisdiction, but not less than the following:
      a. Class CW-PG30-SKP.

2.2 RECTANGULAR SKYLIGHTS

A. Rectangular skylights consisting of double-glazed acrylic dome mounted on prefabricated curbs.
   1. Provide factory-assembled skylights that include glazing, extruded-aluminum glazing retainers, gaskets, and inner frames and that are capable of performance requirements indicated.
      a. Insulated thermal break aluminum frame.

B. Performance Requirements
   1. Thermal: U factor not less than 0.74.
   2. Light Transmittance: 64%.
   3. Listed by FM Global as a FM Approvals product for the use identified.
   4. Rated for Moderate Hail exposure as defined by FM Global.

C. Basis-of-Design Product: Subject to compliance with requirements, provide Signature Series Dome, Fixed Industrial Skylight, with Frame Model 800MD, by Sunoptics, an Acuity Brands Company, www.sunoptics.com, or comparable product by one of the following:
   1. Bristolite Skylights, www.bristolite.com.
   2. Carlisle Syntec Systems, www.carlislesyntec.com
   3. CryslaLite Inc., www.crystalitinc.com.
   4. Lane-Aire Manufacturing Corporation, www.lane-aire.com.

D. Shape and Size: Rectangular, nominal 5 foot by 5 foot, and as indicated.

E. Glazing:
   1. Outer Glazing: Manufacturer's standard acrylic with 50% Impact Modified CC2 Prismatic Acrylic.
   2. Inner Glazing: Manufacturer's standard Prismatic polycarbonate.
   3. Color: ClearWhite.

F. Glazing Gaskets: Manufacturer's standard.

G. Prefabricated Curb: In compliance with requirements stated in Section 07 72 00 "Roof Accessories."

H. Condensation Control: Fabricate skylights with integral internal gutters and nonclogging weeps to collect and drain condensation to the exterior.

2.3 TUBULAR SKYLIGHT

A. Source Limitations: All components of tubular skylights shall be made and assembled by one manufacturer.

~~A.~~B. Tubular skylights consisting of transparent roof-mounted skylight dome mounted on prefabricated curb, reflective tube, and ceiling-level diffuser assembly.

~~B.~~C. Basis-of-Design Product: Subject to compliance with requirements, provide Solatube SolaMaster ~~750~~ 330 Series 21 inch Tubular Daylighting Device, or comparable products by one of the following:

1. CrystaLite.
2. VELUX America Inc.

D. PERFORMANCE REQUIREMENTS

1. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:
   a. Air Infiltration Test:
      1) Air infiltration will not exceed 0.30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
2. Water Resistance Test:
   a. No uncontrolled water leakage at 10.5 psf pressure differential with water rate of 5 gallons/hour/sf when tested in accordance with ASTM E 547.
3. Uniform Load Test: All units tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
   a. No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 70 psf (3.35 kPa).
4. Fire Testing:
   a. All domes shall meet fire rating requirements as described in the International Building Code.
   b. Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.
   c. Smoke Density - Rating no greater than 450 per ASTM Standard E 84 in way intended for use. Classification C.
   d. Rate of Burn and/or Extent - Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.
   e. Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

E. Product Requirements:

1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
   a. Glazing: Type DA, 0.143 inch (3.7 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV A), impact modified acrylic blend.
2. LightTracker Reflector, made of aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in the dome to capture low angle sunlight.
3. Roof Flashing Base:
   a. One Piece: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube. Sheet steel, corrosion resistant conforming to ASTM A 653/A 653M or ASTM A 463/A 463M, or ASTM A 792/A792 M, 0.028 inch (0.7 mm) plus or minus .006 inch (.015 mm) thick.
      1) Base Style: Type FC, Curb cap, with inside dimensions of 27 inches by 27 inches (685 mm x 685 mm) to cover curb as specified in Section 07600.
      2) Curb cap shall be mounted on curb Type FCS insulated, galvanized 26.5 inch by 26.5 inch metal curb.
4. Curb Cap Insulator: Type CCI, Thermal isolation material is for use under flashing Type FC.
5. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact PVC; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.

6. Dome Seal: Adhesive backed weatherstrip, 0.63 inch (16 mm) tall by 0.28 inch (7 mm).
7. Reflective Tubes: Aluminum sheet, thickness 0.018 inch (0.5 mm).
    a. General:
        1) Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface. Specular reflectance for visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum reflectance (400 nm to 2500 nm) less than 80.2 percent.
        2) Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
    b. Tube Angle Adapters:
        1) Top and Bottom Tube Angle Adapter, Type AK:
            a) Reflective 45 degree adjustable Top and Bottom Tube Angle Adapter, 16 inches (406 mm) long.
        2) Top Tube Angle Adapter, Type TA:
            a) Reflective 45 degree adjustable Top Tube Angle Adapter, 16 inches (406 mm) long.
    c. Extension Tube:
        1) Reflective extension tube, Type EXX, Notched for Open Ceiling diffuser attachment, 24 inches (610 mm) or 48 inches (1220 mm) long.
8. Local Dimmer Control utilizing a butterfly baffle design of Spectralight Infinity reflective material to minimize shadowing when in use. Provided with dimmer switch and cable.
    a. Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; Maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, 22 gauge cable; providing daylight output between 2 and 100 percent.
    b. Switch: Type SW, Manufacturer-specific low voltage DC DP/DT switch (white) required to operate Daylight Dimmer. Note: A maximum of 10 units can be connected to one switch.
    c. Cable: Type CA, Two conductor, 22 gauge, low voltage cable (500 ft.) for multiple unit DC connection.
9. Diffuser Assemblies for Tubes Penetrating Ceilings: (Solatube Model 330 DS-C). Ceiling mounted box transitioning from round tube to square ceiling assembly, supporting light transmitting surface at bottom termination of tube 23.8 inches by 23.8 inches (605 mm by 605 mm) square frame to fit standard suspended ceiling grids or hard ceilings.
    a. Round to square transition box made of opaque polymeric material, classified as CC2, Class C, 0.110 inch (2.8 mm) thick.
    b. Lens: Type L94 Custom acrylic lens design to maximize light output and diffusion with extruded aluminum frame and EPDM foam seal to minimize condensation and bug, dirt and air infiltration per ASTM E 283. Classified as CC2.
    c. Supplemental Natural Effect Lens made of acrylic, classified as CC2, Class C, 0.060 inch (1.5 mm) thick, with open cell foam seal to minimize condensation and bug, dirt and air infiltration per ASTM E 283.
    d. Secondary Lens: Type SS, Acrylic plastic classified as CC2 material. Thickness shall not be less than 0.100 inches.
10. Diffuser Assemblies for Tubes Not Penetrating Ceilings (Open Ceiling): (Solatube Model 330 DS-O) 21 inch (530 mm) diameter diffuser attached directly to bottom of tube.
    a. Diffuser Lens: Custom diffuse acrylic lens L94.
    b. Diffuser Seal: Open cell foam, acrylic adhesive backed, 0.75 inch (19 mm) wide by 0.125 inch (3.2 mm) thick to minimize condensation and bug, dirt and air infiltration per ASTM E 283.
    c. Diffuser Trim Ring: Injection molded acrylic. Nominal wall thickness 0.172 inches (4.4 mm).

d. Secondary Diffuser: Type SS, Acrylic plastic classified as CC2 material. Thickness shall not be less than 0.100 inches.

e. Accessories: Open Ceiling Trim Ring: Type R, ABS Plastic, White; nominal thickness of 0.04 inches (1 mm).

11. Solatube Catalog Number for Closed Ceiling: S330 DS-C-DASS-FC-CCI-AK-Exx-L94-LN-I.

12. Solatube Catalog Number for Open Ceiling: S3300 DS-O-DA-SS-FC-CCI-Exx-TAR-L94-I.

~~2.~~13.

~~C. Tubular Skylights:~~

~~1. All components made and assembled by one manufacturer.~~

~~2. Design to withstand the following loads without breakage or permanent damage to any parts, when tested in accordance with ASTM E330:~~

~~a. Positive and negative wind load of 10 psf.~~

~~b. No permanent deflection in excess of 0.2 percent of span.~~

~~c. Live load of 100 psf on dome with safety factor of 3.~~

~~3. Air Infiltration: Maximum 0.10 cfm per foot of crack length at 6.24 psf pressure differential when tested in accordance with ASTM E283.~~

~~4. Water Resistance: No uncontrolled water leakage at 6.24 psf pressure differential with water rate of 5 gallons/h/sf, when tested in accordance with ASTM E331; design to ensure that water will not accumulate inside assembly.~~

~~5. Thermal Movement: Fabricate to allow for thermal movement resulting from temperature differential from minus 30 to 180 degrees F.~~

~~6. Flammability: Non-metal parts complying with the following:~~

~~a. Roof-Top Components: Class B when tested in accordance with ASTM E108 or UL 790.~~

~~b. Self-Ignition Temperature: Greater than 650 degrees F, when tested in accordance with ASTM D1929.~~

~~c. Smoke Developed Index: Maximum of 450, when tested in accordance with ASTM E84; or maximum rating of 75, when tested in accordance with ASTM D2843.~~

~~d. Combustibility - Light Transmitting Parts: Minimum 2.5 inches/min (ICC Class CC-2), when tested in accordance with ASTM D635.~~

~~e. Combustibility - Non-Light Transmitting Parts: Minimum 2.5 inches/min (ICC Class CC-2), when tested in accordance with ASTM D635.~~

~~7. Roof Assemblies: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.~~

~~a. Glazing: Polycarbonate plastic, 0.125 inch minimum thickness.~~

~~b. Low Angled Sun Reflector: Light intercepting transfer device, made of same material as main tube, to capture low angle sunlight.~~

~~c. Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.~~

~~1) Base Material: Sheet steel, galvanized (ASTM A653/A653M), 0.028 inch thick, minimum.~~

~~2) Base Height: 11 inches.~~

~~3) Base Pitch (Slope): Flat, no pitch.~~

~~d. Dome Ring: Attached to top of base section; 0.090 inch nominal thickness injection molded high impact ABS; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing; weather seal of medium density pile weather stripping.~~

~~8. Reflective Tube: ASTM B209 (ASTM B209M) aluminum sheet, thickness between 0.015 inch and 0.020 inch.~~

~~a. Interior Finish: Exposed interior surfaces of high reflectance specular finish; specular reflectance 99, total reflectance 93 percent.~~

~~b. Tube Diameters: As indicated on the Drawings.~~

~~c. Extension Tube: Type EXX.~~

~~9. Diffuser Assemblies: Supporting light transmitting surface at bottom termination of tube, with compression seal to minimize condensation and bug or dirt infiltration.~~

~~a. Ceiling Ring: Edge trim for ceiling opening; injection molded high impact ABS.~~
~~b. Diffuser Trim: Edge and attachment trim for diffuser lens; injection molded high impact ABS.~~
~~c. Diffuser Shape at Solid Ceilings: Round, same diameter as tube~~
~~d. Diffuser Shape in Lay-In Ceiling Grid: Square, 24 by 24 inches, to fit grid; metal transition box.~~
~~e. Diffuser Shape at No Ceiling: Round, same diameter as tube.~~
~~f. Lens: Flush frosted lens.~~
~~g. Lens Material: Polycarbonate plastic.~~
~~h. Lens Thickness: 0.038 inch, minimum.~~
~~i. Visible Light Transmission: Minimum 90 percent.~~
~~j. Seal: Closed cell EPDM foam rubber.~~
~~k. Local Dimmer Control: Provided with dimmer switch and cable.~~
~~l. Daylight Dimmer: Type D electromechanically actuated daylight valve for universal input voltages ranging between 90 and 277V at 50 or 60 Hz; maximum current draw of 50 ma per unit, controlled by low voltage, series Type T02 circuited, 4 conductor, size 22 cable; providing daylight output between 2 and 100 percent. Provided with dimmer switch and cable.~~
~~m. Switch: Type SW, manufacturer specific low voltage DC DP/DT swtich (white) required to operate Daylight Dimmer. Note: only one switch is required per set of synchronously controlled dimmers.~~

2.4 ACCESSORY MATERIALS

A. Roof Curbs: Insulated Self-Flashing Curbs.
1. Basis of Design: Subject to compliance with requirements provide Type FCS curbs by Colorado Curb Company, or comparable products by one of the following:
a. AES Industries.
b. LM Curbs.
c. Thybar Corporation.
2. Constructed of 18 gauge galvanized steel with continuous welded seams and integral base plate. Lined with 1 ½ inch fiberglass fire proof sound attenuating thermal insulation, with 2 inch by 2 inch treated wood nailer secured to top ledge of curb.
3. Height: 16 inches, or as indicated.
4. Size: As required to match tubular skylight.

~~A.~~B. Fasteners: Same metal as metal being fastened, nonmagnetic stainless steel, or other noncorrosive metal as recommended by manufacturer. Finish exposed fasteners to match material being fastened.
1. Where removal of exterior exposed fasteners might allow access to building, provide nonremovable fastener heads.

C. Suspension Wire: Steel, annealed, galvanized finish, size and type appropriate for application.

~~1.~~D. Sealant: Elastomeric sealant as recommended by skylight manufacturer.

~~B.~~E. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.5 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, 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

A. Coordinate installation of unit skylights with installation of substrates, vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.

B. Comply with recommendations in AAMA 1607 and with manufacturer's written instructions for installing unit skylights.

C. Install unit skylights level, plumb, and true to line, without distortion.

D. Anchor unit skylights securely to supporting substrates. Mechanically fasten reflective tubes and tube extensions.

E. Where aluminum surfaces of unit skylights will contact another metal or corrosive substrates, such as preservative-treated wood, apply bituminous coating on concealed metal surfaces or provide other approved permanent separation recommended in writing by unit skylight manufacturer.

F. Install dimmers and controls for complete operation.

3.3 FIELD QUALITY CONTROL

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

B. After completion of installation and nominal curing of sealant and glazing compounds but before installation of interior finishes, test for water leaks according to AAMA 501.2.

C. Perform test for total area of each skylight.

D. Work will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.4 CLEANING

A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes.

B. Remove excess sealants, glazing materials, dirt, and other substances.

C. Remove and replace glazing that has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

E. Unit Skylight Operating System: Clean and lubricate joints and hardware. Adjust for proper operation.

END OF SECTION 08 62 00

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Bidding Documents and Information, Conditions of the Contract and Division 1 - General Requirements apply to the Work of this Section of the Specifications.

B. Section Includes, But is Not Limited to, Hardware For:
   1. Steel Doors and Frames.
   2. Wood Doors
   3. Aluminum Storefront Doors
   4. Weatherstripping, seals and thresholds.
   5. Thresholds at Wood Flooring Under Gymnasium Doors.
   6. Electrified Hardware

C. Hardware shall be provided with all necessary standard and special fasteners, screws, bolts, expansion shields or anchors to properly secure hardware to its intended door frame or other surface.

D. Intent of Hardware Groups
   1. The following schedule of hardware sets shall be considered a guide only, and the supplier is cautioned to refer to general conditions, special conditions, and the preamble of this section. It shall be the hardware supplier's responsibility to furnish all required hardware.
   2. Where items of hardware aren't definitely or correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy shall be sent to the Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
   3. Adjustments to the Contract Sum will not be allowed for omissions or items of hardware not clarified prior to bid opening.

1.2 RELATED SECTIONS

A. Division 6– Finish Carpentry: Installation of Finish Hardware

B. Division 7 - Joint Sealants.

C. Section 08 11 13 "Hollow Metal Doors and Frames".

D. Section 08 12 16 "Aluminum Frames".

E. Section 08 14 16 "Flush Wood Doors".

F. Section 08 33 23 "Overhead Coiling Doors" for door hardware provided as part of overhead door assemblies.

G. Section 08 33 26 "Overhead Coiling Grilles" for door hardware provided as part of overhead grille assemblies.

H. Section 08 34 73 "Sound Control Door Assemblies" for hinges and gasketing provided as part of sound-rated door assemblies.

I. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts" for installation of entrance door hardware including cylinders.

J. Section 28 13 00 "Access Control" for access control devices installed at door openings and provided as part of a security system.

K. Section 28 16 00 "Intrusion Detection" for detection devices installed at door openings and provided as part of an intrusion-detection system.

1.3 REFERENCES

A. Use date of standard or code in effect as of Bid date.

B. State and Local Codes including Authority Having Jurisdiction

C. ANSI/BHMA A156 – Builders Hardware Manufacturers Association Builders Hardware Standards

D. ANSI A156.19 – Power Assist and Low Energy Power Operated Doors

E. NFPA – National Fire Protection Association
   1. NFPA 80 – Fire Doors and Windows
   2. NFPA 105 – Smoke and Draft Control Door Assemblies
   3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
   4. NFPA 101 – Life Safety Code.

F. UL – Underwriters Laboratories
   1. UL10C – Fire Tests of Door Assemblies (Positive Pressure)
   2. UL 1784 - Air Leakage Tests of Door Assemblies

G. ANSI A117.1 – Accessible and Usable Buildings and Facilities

H. ADA – Americans with Disabilities Act

I. DHI – Door and Hardware Institute

J. SDI – Steel Door Institute

K. WDMA – Window and Door Manufacturers Association

1.4 SUBMITTALS

A. General Requirements: Division 1.

B. Product Data: Submit manufacturer’s complete product literature for specified hardware items, detailed installation diagrams and instructions, including:

   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Door Hardware Schedule: Prepared by or under the supervision of the supplier’s Architectural

Hardware Consultant, 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. Check specified hardware for suitability and adaptability to details and surrounding conditions. Indicate unsuitable or incompatible items and proposed substitutions in hardware schedule.
2. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
3. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
4. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
5. Content: Include the following information:
    a. Type, style, function, size, label, hand, degree of swing, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.

6. Electrified Hardware Drawings:
    a. Submit elevation drawings showing relationship of all electrical hardware components to door and frame prior to electrical rough-in. Indicate number and gage of wires required.
    b. Include wiring drawing showing point to point wire hook up for all components.
    c. Include system operations descriptions for each type of opening; describe each possible condition.

D. Samples:
    1. Upon request submit the following samples:
        a. Submit one sample of each type or item of hardware which will be exposed to view for Architect's approval of appearance, color, and finish if required. Samples will be returned to the Contractor upon request after completion of the Work.

E. Keying Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations. Keying Schedule: Per DHI manual "Keying Procedures, Systems, and Nomenclature".

F. Qualification Data: For Installer, Supplier, and Architectural Hardware Consultant. Compliance with this Section shall include letters of certification Certifications shall be submitted for approval with and be incorporated with hardware schedule submittal. Submittals will not be considered without the certifications.

G. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

H. Contract Closeout Submittals: Comply with Division 01 including specific requirements indicated.
   1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
      a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
      b. Catalog pages for each product.
      c. Name, address, and phone number of local representative for each manufacturer.
      d. Parts list for each product.
      e. Copy of final hardware schedule, edited to reflect, "As installed".
      f. Copy of final keying schedule
   2. As installed “Wiring Diagrams” for each piece of hardware connected to power, both low voltage and 110 volts.
   3. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.5 QUALITY ASSURANCE

A. Substitutions:
   1. All substitution requests must be submitted within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and their consultant.
   2. Items listed with no substitute manufacturers have been requested by Owner to meet existing standards.

B. Requirements of Regulatory Agencies:
   1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications. Furnish finish hardware to comply with the requirements of the American National Standards for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People (ICC/ANSI A117.1) and to comply with Americans with Disabilities Act (ADA).
   2. Doors to stairs (other than exit stairs), loading platforms, boiler rooms, stages and doors serving other hazardous locations shall have knurled or other similar approved marking of door lever handles or cross bars in accordance with local building codes.

C. Installer Qualifications: An experienced installer with five (5) years documented experience who has completed 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. Factory trained and certified by the lock, closer and panic hardware manufacturers. Alternative: can demonstrate suitably equivalent competence and experience.

D. Supplier Qualifications: Company specializing in the supply of door hardware with five (5) years documented experience and an Architectural Hardware Consultant (AHC) to properly handle, detail and service hardware in a satisfactory manner. Architectural Hardware Consultant shall be available during the course of the Work to consult with Contractor, Architect, Hardware Consultant, and Owner about door hardware and keying.
   1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
   2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
   3. Hardware supplier shall be a certified direct distributor and be a full sales and service organization for the manufacturer’s listed. Compliance with this Section shall include letters of certification from the manufacturers stating the hardware supplier is a factory direct authorized distributor. Certifications shall be submitted for approval with and be

incorporated with hardware schedule submittal. Submittals will not be considered without the certifications.

1) Supplier shall have warehousing facilities in Project's vicinity.

E. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1. Electrified Door Hardware Consultant Qualifications: A qualified Architectural Hardware Consultant who is experienced in providing consulting services for electrified door hardware installations.

F. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

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.

G. Fire-Rated Door Assemblies: Provide door hardware for 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 NFPA 252 and UL10C. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, plus resilient and required intumescent seals if not furnished with wood door.

H. Templates: Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.

I. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01. In addition to Owner, Construction Manager, Contractor, and Architect, conference participants shall also include Suppliers Architectural Hardware Consultant and Owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Address for delivery of keys.

J. Mandatory Pre-installation Meeting:

1. Before hardware installation, General Contractor/Construction Manager will request seminar be conducted on the installation of hardware; specifically that of locksets, closers, and exit devices. The hardware supplier and the representative of the lock, closer and exit device manufacturers shall present the seminar. Seminar to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Seminar to address proper coordination and installation of hardware, per finish hardware schedule for this specific project, by using installation manuals, hardware schedule, templates, physical product samples and installation videos.

2. When any electrical hardware is specified this meeting shall also include the following trades/installers: Electrical and Security Contractors.
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. Failure to hold the pre-installation conference may affect the product warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Marking and packaging:
1. Properly package and mark items according to the approved hardware schedule, complete with necessary screws and accessories, instructions and installation templates for spotting mortising tools.
2. Packaging of door hardware is the responsibility of the supplier. As hardware supplier receives material from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set and door numbers to match the approved hardware schedule. Two or more identical sets may be packed in same container.

B. Delivery:
1. The supplier shall deliver all hardware to the project site; direct factory shipments are not allowed unless agreed upon beforehand. Hardware supplier shall coordinate delivery times and schedules with the contractor. Inventory door hardware jointly with representatives of hardware supplier and hardware installer/contractor until each is satisfied that count is correct.
2. No keys, other than construction master keys and/or temporary keys are to be packed in boxes with the locks.
3. Deliver keys and permanent cores to Owner by registered mail or overnight package service.
4. Contractor shall check deliveries against accepted list and provide receipt for them, after which he is responsible for storage and care. Any shortage or damaged good shall be made without cost to the owner.

C. Storage:
1. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of work will not be delayed by hardware losses both before and after installation.

1.7 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.

1.8 COORDINATION

A. Supplier shall coordinate the following items with the General Contractor and related trades.
1. Coordinate work of this Section with other directly affected Sections involving manufacture of any internal reinforcement for door hardware. Furnish hardware templates to door fabricators for factory preparation to receive hardware.
2. Furnish hardware items of proper design for use on doors and frames of thicknesses, profile, swing, security, and other indicated requirements as necessary for proper function.
3. Coordinate solid blocking between studs of frame construction to support wall mounted items such as stops.

4. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices and access control system.

B. A hardware and keying conference is mandatory within 30 days of contract award.

C. Use hardware consultant to check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1.9 WARRANTY:

A. General Warranty: 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. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of operators and door hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: Two (2) years from date of Substantial Completion, unless otherwise indicated.
1. Warranty Period for Manual Closers: Thirty (30) years from date of Substantial Completion.
2. Warranty Period for Locksets: Ten (10) years from date of Substantial Completion.
3. Warranty Period for Exit Devices: Three (3) years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

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.

1.11 COMMISSIONING:

A. The General Contractor in conjunction with the lock manufacturer’s representative, hardware installer and supplying distributor shall commission hardware as follows.

B. Test door hardware operation with climate control system both at rest and while in full operation.

C. Test electrical and electronic hardware systems for satisfactory operation.

D. Test hardware interfaced with fire/life-safety system for proper operation and release.

1.12 EXTRA MATERIALS

A. Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels.
1. Quantity: Furnish quantity of full-size units.
   a. Provide (10) ten extra interchangeable cores for each Master keyed group.
2. Special Tools: Provide special wrenches and tools applicable to each different or special

hardware component.
3. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
4. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Furnish each category with the products of only one manufacturer unless specified otherwise; this requirement is mandatory whether various manufacturers are listed or not.

B. Provide the products of manufacturer designated or if more than one manufacturer is listed, the comparable product of one of the other manufacturers listed. Where only one manufacturer or product is listed, it is understood that this is the owner's Building Standard and "no substitution" is allowed.

2.2 GENERAL HARDWARE REQUIREMENTS:

A. Provide hardware materials and products of the best quality, free from imperfections and flaws in appearance, finish, or operational function.

B. Refer to Hardware Schedule below for specific hardware items, designs, functions, sizes, and finishes.

2.3 HINGES

A. Manufacturers:
1. Ives
2. McKinney
3. Stanley

B. General: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Hinges shall be three-knuckle design, concealed bearing as specified with NRP (non-removable pin) feature, at all reverse bevel doors with locksets.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:
1. Exterior Hinges: Stainless steel with stainless-steel non-removable pin.
2. Interior Hinges: Steel, with steel pin
3. Hinges for Fire-Rated Assemblies: Steel, with steel pin.

E. Quantity, regardless of quantities specified in the hardware schedule provide the following:
1. 2 - hinges per leaf for openings through 60 inches (1524 mm) high.
2. 1 - additional hinge per leaf for each additional 30 inches (762 mm) in height or fraction thereof.

F. Size, provide the following:
1. Doors up to 3'6": 2 ball bearing, standard weight, 0.134 gage, 4-1/2 inch by 4-1/2 inch (114 mm by 114 mm).

2. Doors 3’-6” and over: four ball bearing, heavy weight, 0.190 gage, 5 inches x 4-1/2 inches (127 mm by 114 mm).

G. Provide shims and shimming instructions for proper door adjustment.

H. Electric Hinges:
1. Transfer power from door frame to edge of door.
2. Provide sufficient number of concealed wires to accommodate electric function of specified hardware.
3. Locate electric hinges at second hinge from bottom.
4. Provide mortar guard for each electric hinge scheduled.

I. Electric Power Transfer:
1. Manufacturers:
a. Von Duprin
2. Transfer power from door frame to edge of door.
3. Provide sufficient number of concealed wires to accommodate electric function of specified hardware.

2.4 DOOR BOLTS

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
1. Mortise Flush Bolts: Minimum 3/4-inch (19-mm) throw.

C. Manual Flush Bolts: designed for mortising into door edge.

D. Locate centerline of manual top bolt not more than 78 inches (1981 mm) from finished floor.

E. Dust Proof Strikes - furnish with all flush bolts.

2.5 COORDINATORS

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Provide coordinator for labeled pairs of doors equipped with automatic flush bolts.

C. Provide filler bars for total opening width and closer mounting brackets.

2.6 LOCKSETS AND LATCHSETS

A. Manufacturers:
1. Schlage

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Heavy duty cylindrical type:
   1. Provide cylindrical locksets that comply with ANSI A156.2, Series 4000, Grade 1; tested to exceed 3,000,000 cycles. Functions as listed in Hardware Sets.
   2. Provide cylindrical locksets that meet ANSI A117.1, Accessibility Code.
   3. Provide cylindrical locksets that meet UL A label; to have a minimum listing for single doors 4' x 8'
   4. Levers are to be plated to match BHMA finishes.
   5. Lockset Trim: Schlage Rhodes

D. Strikes:
   1. Provide strikes with extended lips where required to protect trim from being marred by latch bolt. Provide strike lips that do not project more than 1/8" beyond doorframe trim at single doors and have 7/8" lip to center at pairs of 1-3/4" doors. Provide wrought box strikes on all locks.

E. General Contractor to arrange for a keying meeting, and programming meeting with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements.

2.7 HARDWIRED ELECTRONIC LOCKSETS

A. Manufacturers:

   1. Schlage “AD-300”

B. Locksets - Heavy Duty Cylindrical Type
   1. Proximity card reader, request to exit (REX), door position switch and mechanical key override shall be contained in the lockset.
   2. Locksets shall be hardwired, fail secure (FSE).

2.8 CYLINDERS AND KEYING

A. Manufacturers:
   1. Schlage

B. Keying schedule: Supplier shall meet with Owner to finalize keying requirements and obtain keying instructions in writing. All cylinders shall be keyed by supplier, combinated in sets or subsets, masterkeyed or great grandmaster keyed, as directed by Owner.

C. Cylinders:
   1. Manufacturer's interchangeable core type, constructed from brass or bronze, stainless steel, or nickel silver.
   2. Number of Pins: Six
   3. Mortise Type: Threaded cylinders with required cam and trim ring(s).
   4. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   5. Bored-Lock Type: Cylinders with tailpieces to suit locks.

D. Permanent Cores: Manufacturer's standard; finish face to match lockset; interchangeable cores.

E. Key System: Schlage Primus patented keyway at exterior door. Schlage Classic key system at interior doors.

F. Construction Cores: Provide brass construction cores that are replaceable by permanent cores.
   1. The Owner or Owner's Security Agent in conjunction with the service center shall remove construction cores and install final cores.

G. Keys: Provide nickel-silver keys permanently inscribed with a visual key control number and "DO NOT DUPLICATE" notation. Furnish keys in the following quantities:
   1. Cylinder Change Keys: Three.
   2. Master Keys: Five.
   3. Grand Master Keys: Five.
   4. Great-Grand Master Keys: Five.
   5. Temporary construction keys: Twenty.
   6. Construction control keys: Two.
   7. Key Blanks: One Hundred

H. Deliver all permanent keys, security cores, and other security keys direct to Owner from Service Center a minimum of sixty (60) days prior to completion by secure courier return receipt requested.

I. Key Control System:
   1. Provide wall mounted metal cabinet with baked-enamel finish; containing key gathering envelopes, storage of removable and interchangeable lock cores, hook labels, permanent key tags, temporary key tags, signature receipt forms, visible index pin-tumbler cylinder door lock, and instruction book with key capacity of 150 percent of the number of locks.

2.9 EXIT DEVICES AND MULLIONS

A. Exit Devices for Means of Egress Doors: Comply with NFPA 101. Exit devices shall not require more than 15 lbf (67 N) to release the latch. Exit devices shall not require use of a key, tool, or special knowledge for operation.

B. Manufacturers:
   1. Von Duprin

C. Rim Devices:
   1. Exit devices shall be touchpad style plated to the standard architectural finishes to match the balance of the door hardware.
   2. Trim: as specified in sets, function numbers as listed in sets. Levers to match lockset design.
   3. Exit devices shall be UL listed panic exit hardware. All exit devices for fire rated openings shall be UL labeled fire exit hardware.
   4. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.
   5. Provide cylinder dogging on panic exit hardware.
   6. Furnish glass bead kits for exit devices as required.
   7. Supplier to coordinate strike type required with door and frame manufacturer or supplier.
   8. Through Bolts: For exit devices and trim on metal doors, non-fire-rated wood doors, fire-rated wood doors and fire-rated metal doors.
   9. After installation of all exit devices, General Contractor to have Manufacturer's representative inspect installation. Representative shall submit a written report to the Architect with copies to the General Contractor and hardware supplier upon completion of service. This report shall include any installation errors, noting door.

D. Removable Mullion:

1. Interior/Exterior, hollow metal or wood, mullion is removable only through the use of building keys. Mullions shall self lock when re-installed without the use of the cylinder key.
2. Provide two-piece interlocking stabilizer set. One piece shall be installed on the mullion and the other piece installed on the door. Provide shims to adjust for door misalignment.
3. Furnish storage brackets for securely stowing the mullion away from the door when removed.
4. Fire-Exit Removable Mullions: Provide removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

E. Hardwired electronic trim:
1. Proximity card reader, request to exit (REX), door position switch and mechanical key override shall be contained in the lockset.
2. Locksets shall be hardwired, fail secure (FSE).

F. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

2.10 PUSH AND PULL HARDWARE

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Push-Pull Design: As scheduled.

2.11 ELECTRIC STRIKE

A. Manufacturers:
1. Von Duprin

B. Electric strikes shall provide remote release of latchbolts. They shall be designed for use with the type locks shown at each opening where required. Strikes will be UL Listed for Burglary-Resistant Electric Door Strike, and where required, shall be UL listed as electric strikes for Fire Doors or Frames. Faceplates shall be stainless steel with finish as specified for each opening.

C. Solenoids shall be of the continuous duty type for the voltage specified. Plug connectors will be furnished. Strikes shall have an adjustable backbox to compensate for misalignment of door and frame.

2.12 CLOSERS

A. Manufacturers:
1. LCN

B. Surface Closers:
1. Provide door closers that comply with Grade 1 ANSI A156.4 2000, fire rated to UBC 7.2 and UL 10C
2. Closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder and one piece forged steel piston.

3. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped.
4. Hydraulic regulation shall be by tamper-proof, non-critical valves, adjustable with a hex wrench. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
5. Refer to door and frame details, furnish accessories such as drop plates, special templates, spacers and supports as required to correctly install door closers. Install closers to allow maximum degree of opening, position backcheck to activate well in advance of the stop position to cushion the opening swing and prevent door and frame damage. Do not us the door closer to stop door travel.
6. Through Bolts: For surface closers at metal doors, fire-rated metal doors, non-fire-rated wood doors, and fire-rated wood doors.
7. Coordinate with door manufacturer that the top rail of the door is sized appropriately for the surface closer.
8. Doors swinging into exit corridors should provide for corridor clear width as required by applicable codes.
9. Install closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

C. Surface automatic operators (Pneumatic)
1. Where “Low Energy Power Operated Door” are indicated for doors required to be accessible to the disabled, provide pneumatically powered operators complying with the ADA and A156.19 requirements.
2. Locate power unit, control box and exhaust away from door to minimize noise and vibration in pedestrian areas. Maximum distance from control box to operator is 50’. Control box shall be accessible to allow for adjustments in operator performance.
3. Provide complete with drop plates, brackets, or adapters for arms as required to suit details.
4. Provide plenum-rated type cable or tubing where required.
5. Activators:
   a. Furnish actuators and other controls as shown in Hardware Sets.
6. Markings:
   a. Decals: Visible from either side, instructing the user as to the operation and function of the door.
7. Provide complete with drop plates, brackets, or adapters for arms as required to suit details.
8. Provide plenum-rated type cable where required.
9. Hardware supplier shall provide point-to-point wiring diagrams for automatic operator(s) to general and electrical contractor prior to electrical rough in. Electrical contractor shall provide 120VAC to operator and provide and install wiring low voltage wiring from operator to actuators.

2.13 STOPS AND HOLDERS

A. Manufacturers:
1. Ives
2. Rockwood
3. Trimco

B. Provide wall stops for doors, unless other type stops are scheduled or indicated. Where wall stops are not appropriate, provide overhead stops.

C. Wrought, forged, or cast, approximately 2-1/2 inch diameter, convex or concave rubber center according to lock type, concealed fasteners.

D. Silencers for Door Frames: Neoprene or rubber; fabricated for drilled-in application to frame.

2.14 MAGNETIC HOLDERS

A. Manufacturers:
   1. LCN
   2. Rixson
   3. ABH

B. Electromagnetic Door Holders: Coordinate with fire detectors and interface with fire alarm system for labeled fire door assemblies. Tri-voltage design, 24VAC/DC and 120VAC, with a minimum of 35 pounds of holding force.

2.15 OVERHEAD HOLDERS AND STOPS

A. Manufacturers:
   1. Glynn Johnson
   2. Rixson
   3. ABH

B. Type, function and fasteners shall be as specified. Size per manufacturer's selector chart. Plastic end caps, hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.

C. When the overhead holder or stop is installed with a surface closer template closer according to work with the stop or holder. Provide mounting plates with closer if required. If a conflict occurs between the overhead stop thru bolt and the door closer provide a drop plate drilled out to provide clearance for the thru bolt head.

2.16 KICK PLATES

A. Manufacturers:
   1. Ives
   2. Rockwood
   3. Trimco

B. Furnish .050 inches thick, 10" high x door width less 2" at single doors and less 1" at pairs on push side and 1” less door width on pull side, beveled top, bottom, and 2 sides with counter sink holes for fasteners. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less 2”.

C. Fasteners: Manufacturer's standard machine or self-tapping screws.

2.17 THRESHOLDS

A. Manufacturers:
   1. National Guard Products
   2. Pemko
   3. Zero International

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the Accessibility Guidelines for Buildings and Facilities ANSI A117.1

   1. Bevel raised thresholds with a slope of not more than 1:2.

C. Type as listed in sets.

D. Cope at jambs.

E. Where thresholds occur at openings with one or more mullions, they shall be cut for the mullions and extended continuously for the entire opening.

F. Threshold shall have a skid resistant textured surface.

G. If required provide thresholds at doors to gymnasium, coordinate with Architect and sill details,

H. Furnish with non-ferrous Stainless Steel Screws and Lead Anchors.

2.18 DOOR SWEEPS

A. Manufacturers:
   1. National Guard Products
   2. Pemko
   3. Zero International

B. Type as listed in sets.

2.19 WEATHER-STRIPPING

A. Manufacturers:
   1. National Guard Products
   2. Pemko
   3. Zero International

B. Door Gasketing: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide non-corrosive fasteners for exterior applications and elsewhere as indicated. Type as listed in sets.
   1. Apply to head and jamb stops.

C. Fire, Smoke and Draft Control Seals:
   1. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled based on testing according to UL 1784.
   2. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled based on testing according to UL 10C.
   3. Gaskets must comply with UL10C.
   4. Intumescent seals shall be provided by the wood door manufacturer.

D. Where rain drips are specified in hardware groups, provide NGP 16A x full frame width, unless detailed otherwise.

2.20 DOOR POSITION SWITCHES

A. Manufacturers:
   1. Schlage Electrical Products – no substitute

B. Coordinate door and frame preparations with door and frame suppliers.

C. Switches shall be installed in frame head approximately 4 inches (102 mm) from latching door edge.

2.21 LATCH PROTECTORS

A. Manufacturers:

1. Ives
2. Rockwood
3. Trimco

B. Latch protectors shall be 13 gage stainless steel and be of the type required to work with the specified latch.

2.22 SLIDING DOOR HARDWARE

A. Manufacturers:
1. L. E. Johnson

B. Sliding Door Hardware: Provide sets consisting of rails, hangers, supports, bumpers, floor guides, and accessories for a complete installation. Supplier shall provide elevation drawings showing layout of track, hangers and stops with submittal.

2.23 FIRE DEPARTMENT LOCK BOX:

A. Provide five (5) Knox Model No. 3200 series Knox Boxes where located by the Architect (recessed as required by Owner). Recessed mount shall be furnished with recessed mounting kit (RMK) for new concrete or masonry construction. Finish of the Knox Box shall be aluminum.

2.24 MISCELLANEOUS

A. Boxed Power Supplies: Modular unit in NEMA enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems.

B. Furnish items not categorized in the above descriptions but specified by manufacturer’s names in Hardware Sets.

2.25 FABRICATION

A. Base Metals: Produce door hardware units of base metal, 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. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

2.26 FASTENERS

A. Including, but not limited to, wood or machine screws, bolts, bolts, nuts, anchors, etc. of proper type, material, and finish required for installation of hardware.

B. Use phillips head for exposed screws. Do not use aluminum screws to attach hardware.

C. Provide self-tapping (TEC) screws for attachment of sweeps and stop-applied weatherstripping only.

D. Through Bolts: For exit devices and surface closers on non-rated metal doors, fire-rated metal doors non-fire-rated wood doors, and fire-rated wood doors.

2.27 FINISHES

A. Generally, Dull Chrome, US26D / BHMA 626/652. Thresholds and Weatherstrip shall be Mill

Finish Aluminum. Closers shall be Powder Coated Aluminum (BHMA 689). Trim and Flat Goods may be furnished in US32D (BHMA 630), Satin Stainless Steel.

B. Finish of hardware at aluminum doors and frames shall match door and frame, coordinate with Architect.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. 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 ACCEPTABLE INSTALLERS:

A. Factory trained and certified by the lock, closer and panic hardware manufacturers. Alternative: can demonstrate suitably equivalent competence and experience.

B. Automatic operator installer shall be factory trained, certified by AAADM, and experienced to perform the work.

3.2 EXAMINATION

A. The General Contractor in conjunction with the hardware installer and supplying distributor shall examine doors and frames as follows.
   1. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Ensure that walls and frames are square and plumb before hardware installation.
   2. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

C. Beginning of installation means acceptance of existing conditions.

3.3 PREPARATION

A. Wood Doors: Comply with DHI A115-W series.

B. Steel Doors and Frames: Comply with DHI A115 series.
   1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI/SDI A250.6-97.

3.4 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable requirements of SDI, WDMA, NFPA 80, BHMA, and DHI. NOTE: NO POWER DRIVEN TOOLS SHALL BE USED FOR INSTALLATION OF LOCKSETS AND HARDWARE ON DOORS.

B. Use the templates provided by hardware item manufacturer.

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 Custom Steel Doors and Frames."
   2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
   3. Conform to ANSI A117.1 for positioning requirements for the handicapped.

D. Process hardware for aluminum doors in accordance with DHI handbook, Processing Hardware for Custom Aluminum Doors and Frames.

E. Wherever cutting and fitting are required to install hardware on surfaces which are to be painted or finished by others, coordinate removal, storage, and reinstallation or application of surface protections with finishing work specified in other Sections. Do not install surface-mounted items until finishes have been completed on the substrate. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as required for proper installation and operation.

F. Drill and countersink units, which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with referenced standards.

G. Drill pilot holes for fasteners in wood doors and/or frames.

H. Drawings typically depict doors at 90 degrees; doors will actually swing to maximum allowable. Template hardware for maximum allowable degree of swing.

I. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc. Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps. Door Jambs must be cleaned of all dirt, grease, oil, solvents or solvent residue and dust before applying Pressure-Sensitive Adhesive backed Gasketing, Smoke Seal or Weatherstripping.

J. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

K. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
   1. Configuration: Provide the least number of power supplies required to adequately serve doors with electrified door hardware.

L. Automatic operator installation:
   1. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
   2. Mounting: Install door units plumb, level and true to line, without warp or rack of frames with manufacturers prescribed tolerances.
   3. Anchor securely in place.
      a. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
      b. Set headers and arms level and true to location with anchorage for permanent support.
   4. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
   5. Sealants: Comply with requirements specified in Division7 Section "Joint Sealants" to provide weather tight installation.

6. General or Electrical Contractor to install all wiring to operator or control box on a separate circuit breaker routed into header. Install control box. Install pneumatic tubing from control box to operators. Install low voltage wiring from actuators to operator or control box. .
7. Install signage as required by ANSI 156.19.

3.5 ADJUSTING

A. Adjust and check each operating hardware item, and each door assembly to ensure proper operation and function. Lubricate moving parts with lubrication type recommended by manufacturer.

B. Replace units, which cannot be adjusted and lubricated to operate freely and smoothly.

C. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.

D. Make final adjustments and lubrication immediately prior to final acceptance. Adjust door control devices to compensate for final operation of heating and ventilation equipment.
   1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
   2. Backcheck shall be properly located for protection of the door, frame, and applied hardware.

E. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
   1. Verify levers are free from binding.
   2. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.

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 door hardware is without damage or deterioration at time of Substantial Completion.

3.7 FINAL ADJUSTMENT

A. Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.8 DEMOSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

B. Operator Training: Instruct operating staff in proper operation of access control system, including hands-on training. Minimum of eight (8) man-hours covering the operations for each system installed.

3.9 CLEANUP

A. Remove protective material from hardware where present.

B. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.10 ACCEPTANCE

A. Warranty shall not start until Owner Acceptance. Acceptance shall be withheld until the following activities have been successfully completed:
   1. Commissioning per paragraph 1.011.
   2. Delivery and Acceptance of all Operations and maintenance manuals:
   3. Successful Final Test and Inspection of Security System.

3.11 DOOR HARDWARE SCHEDULE

A. Refer to the door schedule for hardware group required at each door opening.

B. Manufacturer Legend:
   1. (ADA) Adams Rite
   2. (BYO) By Others
   3. (DLR) Hardware Dealer/Supplier
   4. (FAL) Falcon
   5. (GLY) Glynn Johnson
   6. (IVE) Ives
   7. (JOH) Johnson Hardware
   8. (LCN) LCN
   9. (NGP) National Guard Products
   10. (PEM) Pemko
   11. (ROC) Rockwood
   12. (SCE) Schlage Electrical Products
   13. (SCH) Schlage
   14. (STA) Stanley
   15. (TBD) To Be Determined
   16. (TRI) Trine
   17. (VON) Von Duprin

HARDWARE SET: 001
DOOR NUMBER:

D001A F008A F107A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

DELETE THE WALL STOP AT D001A,

HARDWARE SET: 002
DOOR NUMBER:

G203A G223B G224A G225A G238A G239A
G265A H210EA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	ENTRANCE LOCK	ND53TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 003
DOOR NUMBER:

C103A E101BAA E219A E222A F003A F105A
F203BA F206BA G242A G256A G324A H224A
H324A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 004
DOOR NUMBER:

C111CA	C115BA	E207BA	E211A	E212A	F006A
F202FA	G204A	G229A	G244B	G246A	G259AA
G307AAA	G322AA	H210DA	H222AA	H322AA	

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 005
DOOR NUMBER:
F001A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	PASSAGE SET	ND10S RHO	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850 WITH REQUIRED EXTENSION(S) AND COUPLER(S)	LCN
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

180 DEGREE SWING

HARDWARE SET: 006
DOOR NUMBER:
F002A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	KEYED FIRE RATED REMOVABLE MULLION	KR9954-STAB-MT54	VON
2	EA	FIRE EXIT HARDWARE	98-L-BE-F-996-06-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
1	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 WITH REQUIRED EXTENSION(S) AND COUPLER(S)	LCN
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	SET	ASTRAGAL	115NA	NGP

HARDWARE SET: 007
DOOR NUMBER:

A002B	B002C	B002D	B102L	D102C	D102CA
D102D	D102E	D103B	D103BA	D107AA	D107C
D108AB	D109B	E214B	F007B	F201BA	F202BB
F203AB	F205A	F205C	F206AA	G220B	G245CB
G250B	G313B	G331B	H203A	H214B	H231B
H314B	H331B				

EACH TO HAVE:

QTY	DESCRIPTION	CATALOG NUMBER	MFR
		HARDWARE BY DOOR / FRAME MANUFACTURER	

HARDWARE SUPPLIER SHALL VERIFY IF CYLINDERS ARE REQUIRED WITH DOOR MANUFACTURER

HARDWARE SET: 008
DOOR NUMBER:

C108A	C110A	C115AA	F202BA	F203DA	G205A
G206A	G207A	G208A	G209A	G210A	G211A
G212A	G214A	G215A	G216A	G217A	G218A
G219AA	G221A	G222A	G230A	G231A	G233A
G234A	G235A	G240A			

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	ENTRANCE LOCK	ND53TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 009
DOOR NUMBER:

E214A	G219A	G226A	G253AA	G253AB	G306AA
G306BA	G306BB	G307AA	G335AA	G335AB	H205BA
H205BB	H208AA	H235AA	H235AB	H304BA	H335AA
H335AB					

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 010
DOOR NUMBER:

C109A	G237B	G266A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 011
DOOR NUMBER:

G252A	G252B	G253A	G253B	G254A	G254B
G333A	G333B	G335A	G335B	G336A	G336B
H235A	H235B	H236A	H236B	H335A	H335B
H336A	H336B				

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-2SI-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 012
DOOR NUMBER:

F203CA	F207AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	PRIVACY LOCK	ND40S RHO	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 013
DOOR NUMBER:
G223A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 014
DOOR NUMBER:
C102AA C114AA G219BA G245AA G245BA H309A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	PRIVACY LOCK	ND40S RHO	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 015
DOOR NUMBER:
G245CA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 016
DOOR NUMBER:
G201BB G220A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

USE 4 HINGES AT DOOR G220A

HARDWARE SET: 017
DOOR NUMBER:

G258A	G313A	G326A	G331A	H214A	H226A
H231A	H314A	H326A	H331A		

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 018
DOOR NUMBER:

G260A	G327A	H211AA	H211BA	H227A	H327A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	FAC RESTRM W/IND	L9486T OCCUPIED/VACANT 06A L583-363 L583375	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 019
DOOR NUMBER:

D108C	G245A	G249A	G251A	G312A	G330A
G332A	H212A	H212B	H213A	H213B	H230A
H232A	H313A	H330A	H332A		

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 020
DOOR NUMBER:

A104A	A104B	C105A	C107A	C111A	C113A
E110A	E117A	E117B	E118A	G261A	G262A
G263A	G264A	G310A	G311A	G320A	G328A
G329A	H220A	H221A	H228A	H229A	H233A
H234A	H311A	H312A	H320A	H328A	H329A
H333A	H334A				

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 021
DOOR NUMBER:

G259A	G322A	H222A	H322A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 022
DOOR NUMBER:
F205B G322B H322B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP CUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

PROVIDE 4 HINGE AT DOOR F205B

HARDWARE SET: 023
DOOR NUMBER:
G248A G307BA G314A H215A H315A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 024
DOOR NUMBER:
F102A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
	EA	SILENCER	SR64	IVE

HARDWARE SET: 025
DOOR NUMBER:

C107B C111B D109AA E117AA H210DB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

AT EXISTING DOOR E117AA REUSE EXISTING HARDWARE IF AVAILABLE TO MATCH HARDWARE SET

HARDWARE SET: 026
DOOR NUMBER:

D103AA E223A F202CA H203AA H204AA H205AA H206AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 027
DOOR NUMBER:

F202A G304A G305A H204A H308A H310A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 028
DOOR NUMBER:

D101A	D101B	D106A	D106B	E207B	G302A
G302B	G303A	G303B	G306A	G306B	G307A
G307B	H205A	H205B	H206A	H206B	H207A
H207B	H208A	H208C	H303A	H303B	H304A
H304B	H305A	H305B	H306A	H306B	

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 029
DOOR NUMBER:
H207CA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	PRIVACY LOCK	ND40S RHO	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 030
DOOR NUMBER:

D102BA	D104B	D105B	D109A	H203B	H207AA
H207BA	H207BB	H303AA	H305AA	H305AB	H305BA
H305BB					

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 031
DOOR NUMBER:
E101DA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
4	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	MULLION SEAL	5100	NGP

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 032
DOOR NUMBER:
B002A E118B G321A H321A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

USE 4 HINGES AT DOOR B002A

HARDWARE SET: 033
DOOR NUMBER:
G259BA G322BA H222BA H322BA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	PASSAGE SET	ND10S RHO	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 034
DOOR NUMBER:
H310B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	DBL CYL STORE LOCK	ND66TD RHO	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 035
DOOR NUMBER:
F206CA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	90S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 036
DOOR NUMBER:
H301A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-BE-996-06-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 037
DOOR NUMBER:
G240C G301D H201B H301B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
4	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850 WITH REQUIRED EXTENSION(S) AND COUPLER(S)	LCN
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 038
DOOR NUMBER:
G240D G301C H201A H301C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850 WITH REQUIRED EXTENSION(S) AND COUPLER(S)	LCN
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 039
DOOR NUMBER:
G309A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 040
DOOR NUMBER:
E101A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT - PREPARE ON HINGE FOR BOTH POWER AND PNEUMATIC TRANSFER	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
1	EA	PRIMUS CORE	20-740	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
100	FT	PNEUMATIC TUBING	925	LCN
1	EA	JAMB MOUNT PUSHPLATE	8310-818T	FAL
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	CONTROL BOX	7982SES	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	BOLLARD POST	8310-866	LCN
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

SCHOOL OPEN HOURS - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION. PRESSING EITHER ACTUATOR OPENS DOOR.

SCHOOL LOCK DOWN HOURS - DOOR IS LOCKED. CARD READER RETRACTS LATCH OF PANIC, LATCH REMAINS RETRACTED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO OPEN DOOR. INSIDE ACTUATOR RETRACTS LATCH OF PANIC AND OPENS DOOR. LX SWITCH IN PANIC HARDWARE SHUNTS OUTSIDE ACTUATOR WHEN LATCH BOLT IS EXTENDED.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS. PANIC HARDWARE IS ALWAYS OPERABLE FOR EGRESS.

HARDWARE SET: 041
DOOR NUMBER:
B103B C100C C101BC E101B H201HA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD	IVE
1	EA	CONT. HINGE	112HD EPT	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	DUMMY PUSH BAR	350-DT-990	VON
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

SEQUENCE OF OPERATION: PRESSING EITHER ACTUATOR OPENS DOOR

SEE SET 42 FOR CONTROL BOX AND TUBING

HARDWARE SET: 042
DOOR NUMBER:
B103A C100B C101BA E201BA H201HB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT - PREPARE ON HINGE FOR BOTH POWER AND PNEUMATIC TRANSFER	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
1	EA	PRIMUS CORE	20-740	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
100	FT	PNEUMATIC TUBING	925	LCN
1	EA	JAMB MOUNT PUSHPLATE	8310-818T	FAL
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	CONTROL BOX	7982SES	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	BOLLARD POST	8310-866	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

SCHOOL OPEN HOURS - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION. PRESSING EITHER ACTUATOR OPENS DOOR.

SCHOOL LOCK DOWN HOURS - DOOR IS LOCKED. CARD READER RETRACTS LATCH OF PANIC, LATCH REMAINS RETRACTED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO OPEN DOOR. INSIDE ACTUATOR RETRACTS LATCH OF PANIC AND OPENS DOOR. LX SWITCH IN PANIC HARDWARE SHUNTS OUTSIDE ACTUATOR WHEN LATCH BOLT IS EXTENDED.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS. PANIC HARDWARE IS ALWAYS OPERABLE FOR EGRESS.

HARDWARE SET: 043
DOOR NUMBER:
H201HC

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	PANIC HARDWARE	CD-98-L-BE-996-06-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 044
DOOR NUMBER:
D108AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	REINFORCED HINGE	FBB223	STA
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
1	EA	PRIMUS CORE	20-740	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

SEQUENCE OF OPERATION: SCHOOL OPEN HOURS - LATCH OF PANIC HARDWARE IS ELECTRICALLY RETRACTED BY SECURITY SYSTEM FOR PUSH/PULL OPERATION. SCHOOL LOCK DOWN HOURS - DOOR IS LOCKED, CARD READER RETRACTS LATCH OF PANIC HARDWARE, DOOR CONTACT MONITORS DOOR POSITION, RX SWITCH IN PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EXIT. LATCHBOLT SWITCH IN PANIC HARDWARE MONITORS LATCHBOLT. PANIC HARDWARE INSIDE IS ALWAYS OPERABLE FOR EGRESS.

HARDWARE SET: 045
DOOR NUMBER:
G240GA H201GA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-EO-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

EXIT ONLY -LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS. PANIC HARDWARE IS ALWAYS OPERABLE FOR EGRESS.

HARDWARE SET: 046
DOOR NUMBER:

C100A C101BB E201BB F201C F201D H202A H202B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 047
DOOR NUMBER:
G240DA H201DA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
1	EA	PRIMUS CORE	20-740	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 048
DOOR NUMBER:
A103B H210B H210C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD EPT	IVE
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 049
DOOR NUMBER:
H210A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
6	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	SEAL	BY FRAME MANUFACTURER	BYO

HARDWARE SET: 050
DOOR NUMBER:
G240AA G240AB G301A G301B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-996-06-SNB	VON
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	FIRE/LIFE FLOOR MAG	SEM7820	LCN
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 051
DOOR NUMBER:
C108B C110B E102A E203A F206FA G213A
G244A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	ENTRANCE LOCK	ND53TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 052
DOOR NUMBER:
C101A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	KEYED FIRE RATED REMOVABLE MULLION	KR9954-STAB-MT54	VON
2	EA	FIRE EXIT HARDWARE	98-L-F-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
5	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	SET	ASTRAGAL	115NA	NGP

HARDWARE SET: 053
DOOR NUMBER:
G201B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	ELECTRIC STRIKE	6211AL FSE	VON
1	EA	SURF. AUTO OPERATOR	4811 TBWMS	LCN
100	FT	PNEUMATIC TUBING	925	LCN
1	EA	CONTROL BOX	7981ES	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	CARD READER	BY OTHERS	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

SEQUENCE OF OPERATION: DOOR IS NORMALLY LOCKED, CARD READER RELEASES ELECTRIC STRIKE. THE ELECTRIC STRIKE REMAINS UNLOCKED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO OPEN DOOR. PRESSING THE INSIDE ACTUATOR RELEASES THE ELECTRIC STRIKE AND OPENS THE DOOR.

HARDWARE SET: 054
DOOR NUMBER:

C102A	C114A	E104B	E106A	E204A	E205A
F204A	G237A	G259B	H222B		

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 055
DOOR NUMBER:
F203AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8	IVE
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MT-RHO-JD	SCE
1	EA	FSIC CONST. CORE	23-030-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE
1	EA	POWER SUPPLY	FOR AD-300 LOCK BY OTHERS	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

CARD READER AT ACCESS CONTROL TRIM UNLOCKS LEVER.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

IF A CONFLICT OCCURS BETWEEN THE OVERHEAD STOP THRU BOLT AND THE DOOR CLOSER PROVIDE A DROP PLATE DRILLED OUT TO PROVIDE CLEARANCE FOR THE THRU BOLT HEAD

HARDWARE SET: 056
DOOR NUMBER:
F207A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	PASSAGE SET	ND10S RHO	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 057
DOOR NUMBER:
B001C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED FIRE RATED REMOVABLE MULLION	KR9954-STAB-MT54	VON
2	EA	FIRE EXIT HARDWARE	98-L-F-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	SET	ASTRAGAL	115NA	NGP

HARDWARE SET: 058
DOOR NUMBER:
F202B F206C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 - AT SCREEN DOOR	IVE
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	ELECTRIC HW HINGE	5BB1HW 5 X 4.5 TW8	IVE
1	EA	PASSAGE SET	ND10S RHO - AT SCREEN DOOR	SCH
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MT-RHO-JD	SCE
1	EA	FSIC CONST. CORE	23-030-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	LOCK GUARD	LG12	IVE
1	EA	CLOSER WITH HOLD OPEN ARM	4040XP HW/PA TBWMS - INSTALL REGULAR ARM - AT SCREEN DOOR	LCN
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - ST-1595 - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
3	EA	SILENCER	SR64 - AT SCREEN DOOR	IVE
1	EA	DOOR BELL	270 X 45LA X 5203 – PROVIDE PUSH BUTTON WITH .625” STAINLESS STEEL SINGLE GANG WALL PLATE – VERIFY WITH ELECTRICAL CONTRACTOR TYPE OF TRANSFORMER REQUIRED	TRI
1	EA	POWER SUPPLY	FOR AD-300 LOCK BY OTHERS	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

CARD READER AT ACCESS CONTROL TRIM UNLOCKS LEVER.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 059
DOOR NUMBER:
F203B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	ELECTRIC HW HINGE	5BB1HW 5 X 4.5 TW8	IVE
1	EA	VANDL STOREROOM LOCK	ND96TD RHO N123-062	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	LOCK GUARD	LG12	IVE
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	DOOR BELL	270 X 45LA X 5203 – PROVIDE PUSH BUTTON WITH .625” STAINLESS STEEL SINGLE GANG WALL PLATE – VERIFY WITH ELECTRICAL CONTRACTOR TYPE OF TRANSFORMER REQUIRED	TRI
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 060
DOOR NUMBER:
F203C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	DOOR CONTACT	674-OH	SCE
			BALANCE OF HARDWARE BY DOOR MANUFACTURER	

DOOR POSITION SWITCH MONITORS OPENING

HARDWARE SET: 061
DOOR NUMBER:
G236A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	ELEC CLASSROOM LOCK	CO-100-CY-70-KP-RHO-JD	SCE
1	EA	FSIC CONST. CORE	23-030-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

SEQUENCE OF OPERATION: KEYPAD UNLOCKS LEVER

HARDWARE SET: 062
DOOR NUMBER:
G303AA G303AB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	SET	SLIDING DOOR TRACK	200WF SERIES - SIZE AS REQUIRED	JOH
1	EA	LOCKING FLUSH BOLT	1877	ADA
1	EA	MORTISE THUMBTURN	985T	FAL
1	EA	MORTISE CYLINDER	20-062-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
1	EA	FSIC CORE	23-030	SCH
1	PR	DOOR PULL	BF97 X BF97L	ROC

PROVIDE SETS CONSISTING OF RAILS, HANGERS, SUPPORTS, BUMPERS, FLOOR GUIDES, AND ACCESSORIES FOR A COMPLETE INSTALLATION.

HARDWARE SET: 063
DOOR NUMBER:
E101CA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
8	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
4	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SET: 064
DOOR NUMBER:
E104A E206A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO 14-028	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	DOOR BOTTOM	423N	NGP

HARDWARE SET: 065
DOOR NUMBER:
F002C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	SET	CONST LATCHING BOLT	FB61P	IVE
1	EA	DUST PROOF STRIKE	DP2	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	COORDINATOR	COR X FL	IVE
2	EA	MOUNTING BRACKET	MB	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	ASTRAGAL	355CS	PEM

HARDWARE SET: 066
DOOR NUMBER:
F107C H004A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	SET	CONST LATCHING BOLT	FB52	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	COORDINATOR	COR X FL	IVE
2	EA	MOUNTING BRACKET	MB	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	ASTRAGAL	355CS	PEM

HARDWARE SET: 067
DOOR NUMBER:
E207A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
8	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
6	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 068
DOOR NUMBER:

E101CD	E101DB	E113A	E113B	E116A	E116B
E213C	E213D	E216C	E216D	F101BA	H001B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
4	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	MULLION SEAL	5100	NGP

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

USE 8 HINGES AT DOOR E101DB

HARDWARE SET: 069
DOOR NUMBER:
E213A E213B E216A E216B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
4	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 070
DOOR NUMBER:
F201A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT - PREPARE ON HINGE FOR BOTH POWER AND PNEUMATIC TRANSFER	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
4	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-4RL KL900	VON
	EA		SHARE CONTROL BOX AND TUBING WITH DOOR E221A	LCN

DAY TIME MODE - EXIT DEVICES ARE ELECTRICALLY DOGGED FOR PUSH/PULL OPERATION. PRESSING EITHER ACTUATOR OPENS DOOR.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC, LATCH REMAINS RETRACTED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO ACTIVATE AUTOMATIC OPERATOR. INSIDE SWITCH RETRACTS LATCH OF PANIC AND ACTIVATES AUTOMATIC OPERATORS. LX SWITCH IN PANIC HARDWARE SHUNTS OUTSIDE ACTUATOR WHEN LATCH BOLT IS EXTENDED.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 071
DOOR NUMBER:
G247A G250A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 072
DOOR NUMBER:
E201BD

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD EPT	IVE
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	CARD READER	BY OTHERS	BYO
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	POWER SUPPLY	SHARE POWER SUPPLY WITH DOOR E201BA	VON
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 073
DOOR NUMBER:
E201BC

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 074
DOOR NUMBER:
D102CB E103AA E207AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 075
DOOR NUMBER:
E103A G201A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
4	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 076
DOOR NUMBER:
E110AA E110B E110C E114A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	IVE
2	EA	MANUAL FLUSH BOLT	FB458	IVE
1	EA	DUST PROOF STRIKE	DP2	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAME

DOOR E110AA REUSE EXISTING HARDWARE IF POSSIBLE TO MATCH HARDWARE SET

HARDWARE SET: 077
DOOR NUMBER:
E101CB E101CC

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 078
DOOR NUMBER:
E119A E119B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-996-06-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

DELETE WALL STOP AT DOOR E119B

HARDWARE SET: 079
DOOR NUMBER:
C106A C112A E103B H208B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	REINFORCED HINGE	FBB223	STA
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - ST-1595 - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 080
DOOR NUMBER:
C106B C106C C112B C112C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	PUSH PLATE	8200 6" X 16"	IVE
1	EA	PULL PLATE	8302 10" 4" X 16" F	IVE
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 081
DOOR NUMBER:
B101E

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	PUSH PLATE	8200 6" X 16"	IVE
1	EA	PULL PLATE	8302 10" 4" X 16" F	IVE
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 082
DOOR NUMBER:
H001A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
2	EA	FIRE EXIT HARDWARE	9849-EO-F-LBL-SNB	VON
2	EA	CLOSER WITH STOP ARM	4040XP CUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	ASTRAGAL	355CS - OR BY DOOR MANUFACTURER	PEM

HARDWARE SET: 083
DOOR NUMBER:
D102A D103A D107A D108A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-996-06-SNB	VON
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 084
DOOR NUMBER:
D108BA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	LOCK REINFORCER	A501-566	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 085
DOOR NUMBER:
D102F D103C D107D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	REINFORCED HINGE	FBB223	STA
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
1	EA	PRIMUS CORE	20-740	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - ST-1595 - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-4RL KL900	VON

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

DOORS D102D, D103C, AND D107D CAN SHARE ONE POWER SUPPLY

HARDWARE SET: 086
DOOR NUMBER:
D103CA D103CB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 087
DOOR NUMBER:
D108B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	DBL CYL STORE LOCK	ND66TD RHO	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 088
DOOR NUMBER:
C105BA C105BB C107AA C107AB C111AA C111AB
C113BA C113BB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	PUSH PLATE	8200 6" X 16"	IVE
1	EA	PULL PLATE	8302 10" 4" X 16" F	IVE
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
3	EA	SILENCER	SR64	IVE

180 DEGREE SWING

HARDWARE SET: 089
DOOR NUMBER:
B001A B001B B101C F101AA F101AB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 090
DOOR NUMBER:
A002A F007A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	ELECTRIC HW HINGE	5BB1HW 4.5 X 4.5 TW8	IVE
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MT-RHO-JD	SCE
1	EA	FSIC CONST. CORE	23-030-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	LOCK GUARD	LG12	IVE
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	POWER SUPPLY	FOR AD-300 LOCK BY OTHERS	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

CARD READER AT ACCESS CONTROL TRIM UNLOCKS LEVER.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 091
DOOR NUMBER:
C107CA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	ELECTRIC HW HINGE	5BB1HW 5 X 4.5 TW8	IVE
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MT-RHO-JD	SCE
1	EA	FSIC CONST. CORE	23-030-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	LOCK GUARD	LG12	IVE
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	POWER SUPPLY	FOR AD-300 LOCK BY OTHERS	BYO
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

CARD READER AT ACCESS CONTROL TRIM UNLOCKS LEVER.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 092
DOOR NUMBER:
C100D C101BD

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD	IVE
2	EA	DUMMY PUSH BAR	350-DT-990	VON
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 093
DOOR NUMBER:

B101A	B101B	B102A	B102B	B102C	B102D
B102E	B102F	B102K			

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED FIRE RATED REMOVABLE MULLION	KR9954-STAB-MT54	VON
2	EA	FIRE EXIT HARDWARE	98-L-F-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
5	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	SET	ASTRAGAL	115NA	NGP

HARDWARE SET: 094
DOOR NUMBER:

A102B - ENHANCE	B102G	B102H	B102I	B102J

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
4	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
2	EA	REINFORCED HINGE	FBB223	STA
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - ST1595- - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	DRIP CAP	16A	NGP
1	EA	HEAD SEAL	700SA - INSTALL BEFORE DOOR CLOSER	NGP
2	EA	JAMB SEAL	700ES	NGP
1	SET	ASTRAGAL	115NA	NGP
1	EA	MULLION SEAL	5100	NGP
2	EA	DOOR SWEEP	C627A	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 095
DOOR NUMBER:
A001A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	SET	CONST LATCHING BOLT	FB52	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	COORDINATOR	COR X FL	IVE
2	EA	MOUNTING BRACKET	MB	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	ASTRAGAL	355CS	PEM

HARDWARE SET: 096
DOOR NUMBER:
B002B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE
1	EA	CARD READER	BY OTHERS	BYO
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

DAY TIME MODE - EXIT DEVICES ARE ELECTRICALLY DOGGED FOR PUSH/PULL OPERATION.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.ESS.

HARDWARE SET: 097
DOOR NUMBER:
D107B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	DBL CYL STORE LOCK	ND66TD RHO	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 098
DOOR NUMBER:
F009A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
2	EA	FIRE EXIT HARDWARE	9849-EO-F-LBL-SNB	VON
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	ASTRAGAL	355CS - OR BY DOOR MANUFACTURER	PEM

HARDWARE SET: 099
DOOR NUMBER:
C001A G002A G003A H002A H003A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 100
DOOR NUMBER:
F002B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 101
DOOR NUMBER:
B101D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT - PREPARE ON HINGE FOR BOTH POWER AND PNEUMATIC TRANSFER	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-CD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
1	EA	PRIMUS CORE	20-740	SCH
3	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
100	FT	PNEUMATIC TUBING	925	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	CONTROL BOX	7981ES	LCN
1	EA	WEATHER RING	8310-801	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	BOLLARD POST	8310-866	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900	VON

SCHOOL OPEN HOURS - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION. PRESSING EITHER ACTUATOR OPENS DOOR.

SCHOOL LOCK DOWN HOURS - DOOR IS LOCKED. CARD READER RETRACTS LATCH OF PANIC,

LATCH REMAINS RETRACTED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO OPEN DOOR. INSIDE ACTUATOR RETRACTS LATCH OF PANIC AND OPENS DOOR. LX SWITCH IN PANIC HARDWARE SHUNTS OUTSIDE ACTUATOR WHEN LATCH BOLT IS EXTENDED.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS. PANIC HARDWARE IS ALWAYS OPERABLE FOR EGRESS.

HARDWARE SET: 102
DOOR NUMBER:
E215A E215AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP CUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SUPPLIER SHALL VERIFY SIZE AND WEIGHT OF HINGE AT EXISTING FRAMES

HARDWARE SET: 103
DOOR NUMBER:
F202AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	90S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 104
DOOR NUMBER:

A102A - ENHANCE | A102B | A103A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
4	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SET: 105
DOOR NUMBER:

A105A | F203BA - PAIR

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
2	EA	MANUAL FLUSH BOLT	FB458	IVE
1	EA	DUST PROOF STRIKE	DP2	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
2	EA	OH STOP	450S	GLY
2	EA	KICK PLATE	8400 10" X 1" LDW B4E CS	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SET: 106
DOOR NUMBER:

H304BB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 107
DOOR NUMBER:
F203D

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED FIRE RATED REMOVABLE MULLION	KR9954-STAB-MT54	VON
2	EA	FIRE EXIT HARDWARE	98-L-F-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	SET	ASTRAGAL	115NA	NGP

HARDWARE SET: 108
DOOR NUMBER:
D107BA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 109
DOOR NUMBER:
D104A D105A H303AB

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

IF A CONFLICT OCCURS BETWEEN THE OVERHEAD STOP THRU BOLT AND THE DOOR CLOSER PROVIDE A DROP PLATE DRILLED OUT TO PROVIDE CLEARANCE FOR THE THRU BOLT HEAD

HARDWARE SET: 110
DOOR NUMBER:
D102B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	DBL CYL STORE LOCK	ND66TD RHO	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP HCUSH TBWMS	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 111
DOOR NUMBER:
H304AA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP CUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 112
DOOR NUMBER:
F203A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
5	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
2	EA	SILENCER	SR64	IVE

HARDWARE SET: 113
DOOR NUMBER:
F207B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	PASSAGE SET	ND10S RHO	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 114
DOOR NUMBER:
G201BA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD EPT	IVE
1	EA	POWER TRANSFER	EPT10	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S)	SCH
1	EA	PRIMUS CORE	20-740	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
1	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-4RL KL900	VON

DAY TIME MODE - EXIT DEVICES ARE MECHANICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 115
DOOR NUMBER:
G201BC

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP CUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 116
DOOR NUMBER:
G237C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 117
DOOR NUMBER:
G232A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
7	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
2	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 118
DOOR NUMBER:
E202A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-L-2SI-996-06-SNB	VON
4	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
7	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP/HOLD OPEN ARM	4040XP SHCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP
1	EA	MULLION SEAL	5100	NGP

HARDWARE SET: 119
DOOR NUMBER:
C101B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-2SI-996-06-SNB	VON
2	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 120
DOOR NUMBER:
E103C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	IVE
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 121
DOOR NUMBER:
E221B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-DT-990-SNB	VON
2	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	POWER SUPPLY	SHARE POWER SUPPLY WITH DOOR E221A	VON
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE ELECTRICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 122
DOOR NUMBER:
E221A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
1	EA	PNEUMATIC TRANSFER	4840-460	LCN
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-DT-990-SNB	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
2	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
4	EA	FSIC CORE	23-030	SCH
1	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	CUSH SHOE SUPPORT	4840-30	LCN
1	EA	SPACER	4840-61	LCN
1	EA	SURF. AUTO OPERATOR WITH STOP ARM	4841 SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
100	FT	PNEUMATIC TUBING	925	LCN
1	EA	JAMB MOUNT PUSHPLATE	8310-818T	FAL
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	CONTROL BOX	7982SES	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	LCN
1	EA	BOLLARD POST	8310-866	LCN
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
1	EA	CARD READER	BY OTHERS	BYO
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR
1	EA	POWER SUPPLY	PS914 900-BBK 900-4RL KL900	VON

DAY TIME MODE - EXIT DEVICES ARE ELECTRICALLY DOGGED FOR PUSH/PULL OPERATION. PRESSING EITHER ACTUATOR OPENS DOOR.

NIGHT TIME MODE - CARD READER RETRACTS LATCH OF PANIC, LATCH REMAINS RETRACTED FOR SUFFICIENT TIME TO ALLOW OUTSIDE ACTUATOR TO ACTIVATE AUTOMATIC OPERATOR. INSIDE SWITCH RETRACTS LATCH OF PANIC AND ACTIVATES AUTOMATIC OPERATORS. LX SWITCH IN PANIC HARDWARE SHUNTS OUTSIDE ACTUATOR WHEN LATCH BOLT IS EXTENDED.

LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 123
DOOR NUMBER:
F201B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD EPT	IVE
2	EA	POWER TRANSFER	EPT10	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	ELEC PANIC HARDWARE	LX-RX-EL-SD-98-DT-990-SNB	VON
2	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT SPECIAL DOGGING	SCH
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	CLOSER WITH STOP ARM	4040XP SCUSH TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	MULLION SEAL	5100	NGP
1	EA	THRESHOLD	613 - WITH SIA COATING	NGP
2	EA	DOOR CONTACT	679-05HM	SCE
1	EA	POWER SUPPLY	SHARE POWER SUPPLY WITH DOOR F201A	VON
1	EA	WIRING DIAGRAM	AS REQUIRED	DLR

DAY TIME MODE - EXIT DEVICES ARE ELECTRICALLY DOGGED FOR PUSH/PULL OPERATION.

NIGHT TIME MODE - LATCHBOLT POSITION SWITCH AND DOOR POSITION SWITCH MONITOR OPENING. REQUEST TO EXIT SWITCH AT PANIC HARDWARE SHUNTS DOOR CONTACT FOR LEGAL EGRESS.

HARDWARE SET: 124
DOOR NUMBER:
F107B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 125
DOOR NUMBER:
F201BB F201BC

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
2	EA	CONT. HINGE	112HD	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB-MT54	VON
2	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX - WITH REQUIRED CAM AND TRIM RING(S) - AT MULLION	SCH
2	EA	MORTISE CYLINDER	20-061-ICX XQ11-948 - AT CYLINDER DOGGING	SCH
3	EA	FSIC CORE	23-030	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
2	EA	PA MOUNTING PLATE	4040-18PA	LCN
2	EA	CUSH SHOE SUPPORT	4040-30	LCN
2	EA	BLADE STOP SPACER	4040-61	LCN
2	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
2	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	ASTRAGAL	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 126
DOOR NUMBER:
H208BA

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	IVE
1	EA	CLASSROOM LOCK	ND70TD RHO	SCH
1	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP	450S	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

HARDWARE SET: 127
DOOR NUMBER:
G227A G228A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	PUSH PLATE	8200 6" X 16"	IVE
1	EA	PULL PLATE	8302 10" 4" X 16" F	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CVX	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 128
DOOR NUMBER:
D110A D111A E105A E107A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	IVE
1	EA	PRIVACY LOCK	ND40S RHO	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B4E CS	IVE
1	EA	WALL STOP	WS406/407CCV	IVE
1	SET	SEALS	5050B HEAD AND JAMBS	NGP

HARDWARE SET: 129
DOOR NUMBER:
C115A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
3	EA	HW HINGE	5BB1HW 4.5 X 4.5	IVE
1	EA	CLASSROOM SECURITY	ND75TD RHO XN12-035	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	OH STOP & HOLDER	90H	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA TBWMS - INSTALL REGULAR ARM	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E CS	IVE
3	EA	SILENCER	SR64	IVE

IF A CONFLICT OCCURS BETWEEN THE OVERHEAD STOP THRU BOLT AND THE DOOR CLOSER PROVIDE A DROP PLATE DRILLED OUT TO PROVIDE CLEARANCE FOR THE THRU BOLT HEAD

HARDWARE SET: 130
DOOR NUMBER:
F201BD

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD	IVE
1	EA	PANIC HARDWARE	CD-98-NL-990-SNB	VON
1	EA	RIM CYLINDER	20-057-ICX	SCH
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
1	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

HARDWARE SET: 131
DOOR NUMBER:
F201BE

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	MFR
1	EA	CONT. HINGE	112HD	IVE
1	EA	PANIC HARDWARE	CD-98-DT-990-SNB	VON
1	EA	MORTISE CYLINDER	20-061-ICX XQ11-948	SCH
2	EA	FSIC CORE	23-030	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS - INSTALL PARALLEL ARM	LCN
1	EA	PA MOUNTING PLATE	4040-18PA	LCN
1	EA	CUSH SHOE SUPPORT	4040-30	LCN
1	EA	BLADE STOP SPACER	4040-61	LCN
1	EA	WALL STOP/HOLDER	WS40 OR WS45 - AS REQUIRED	IVE
1	EA	DOOR BOTTOM	BY DOOR/FRAME MANUFACTURER	BYO
1	EA	SEAL	BY DOOR/FRAME MANUFACTURER	BYO

END OF SECTION

Door/Hardware Index

Door #	HWSet #
A001A	095
A002A	090
A002B	007
A102A - ENHANCE	104
A102B	104
A102B - ENHANCE	094
A103A	104
A103B	048
A104A	020
A104B	020
A105A	105
B001A	089
B001B	089
B001C	057
B002A	032
B002B	096
B002C	007
B002D	007
B101A	093
B101B	093
B101C	089
B101D	101
B101E	081
B102A	093
B102B	093
B102C	093
B102D	093
B102E	093
B102F	093
B102G	094
B102H	094
B102I	094
B102J	094
B102K	093
B102L	007
B103A	042
B103B	041
C001A	099
C100A	046
C100B	042
C100C	041

Door #	HWSet #
C100D	092
C101A	052
C101B	119
C101BA	042
C101BB	046
C101BC	041
C101BD	092
C102A	054
C102AA	014
C103A	003
C105A	020
C105BA	088
C105BB	088
C106A	079
C106B	080
C106C	080
C107A	020
C107AA	088
C107AB	088
C107B	025
C107CA	091
C108A	008
C108B	051
C109A	010
C110A	008
C110B	051
C111A	020
C111AA	088
C111AB	088
C111B	025
C111CA	004
C112A	079
C112B	080
C112C	080
C113A	020
C113BA	088
C113BB	088
C114A	054
C114AA	014
C115A	129
C115AA	008
C115BA	004
D001A	001
D101A	028

Door #	HWSet #
D101B	028
D102A	083
D102B	110
D102BA	030
D102C	007
D102CA	007
D102CB	074
D102D	007
D102E	007
D102F	085
D103A	083
D103AA	026
D103B	007
D103BA	007
D103C	085
D103CA	086
D103CB	086
D104A	109
D104B	030
D105A	109
D105B	030
D106A	028
D106B	028
D107A	083
D107AA	007
D107B	097
D107BA	108
D107C	007
D107D	085
D108A	083
D108AA	044
D108AB	007
D108B	087
D108BA	084
D108C	019
D109A	030
D109AA	025
D109B	007
D110A	128
D111A	128
E101A	040
E101B	041
E101BAA	003
E101CA	063

Door #	HWSet #
E101CB	077
E101CC	077
E101CD	068
E101DA	031
E101DB	068
E102A	051
E103A	075
E103AA	074
E103B	079
E103C	120
E104A	064
E104B	054
E105A	128
E106A	054
E107A	128
E110A	020
E110AA	076
E110B	076
E110C	076
E113A	068
E113B	068
E114A	076
E116A	068
E116B	068
E117A	020
E117AA	025
E117B	020
E118A	020
E118B	032
E119A	078
E119B	078
E201BA	042
E201BB	046
E201BC	073
E201BD	072
E202A	118
E203A	051
E204A	054
E205A	054
E206A	064
E207A	067
E207AA	074
E207B	028
E207BA	004

Door #	HWSet #
E211A	004
E212A	004
E213A	069
E213B	069
E213C	068
E213D	068
E214A	009
E214B	007
E215A	102
E215AA	102
E216A	069
E216B	069
E216C	068
E216D	068
E219A	003
E221A	122
E221B	121
E222A	003
E223A	026
F001A	005
F002A	006
F002B	100
F002C	065
F003A	003
F006A	004
F007A	090
F007B	007
F008A	001
F009A	098
F101AA	089
F101AB	089
F101BA	068
F102A	024
F105A	003
F107A	001
F107B	124
F107C	066
F201A	070
F201B	123
F201BA	007
F201BB	125
F201BC	125
F201BD	130
F201BE	131

Door #	HWSet #
F201C	046
F201D	046
F202A	027
F202AA	103
F202B	058
F202BA	008
F202BB	007
F202CA	026
F202FA	004
F203A	112
F203AA	055
F203AB	007
F203B	059
F203BA	003
F203BA - PAIR	105
F203C	060
F203CA	012
F203D	107
F203DA	008
F204A	054
F205A	007
F205B	022
F205C	007
F206AA	007
F206BA	003
F206C	058
F206CA	035
F206FA	051
F207A	056
F207AA	012
F207B	113
G002A	099
G003A	099
G201A	075
G201B	053
G201BA	114
G201BB	016
G201BC	115
G203A	002
G204A	004
G205A	008
G206A	008
G207A	008
G208A	008

Door #	HWSet #
G209A	008
G210A	008
G211A	008
G212A	008
G213A	051
G214A	008
G215A	008
G216A	008
G217A	008
G218A	008
G219A	009
G219AA	008
G219BA	014
G220A	016
G220B	007
G221A	008
G222A	008
G223A	013
G223B	002
G224A	002
G225A	002
G226A	009
G227A	127
G228A	127
G229A	004
G230A	008
G231A	008
G232A	117
G233A	008
G234A	008
G235A	008
G236A	061
G237A	054
G237B	010
G237C	116
G238A	002
G239A	002
G240A	008
G240AA	050
G240AB	050
G240C	037
G240D	038
G240DA	047
G240GA	045

Door #	HWSet #
G242A	003
G244A	051
G244B	004
G245A	019
G245AA	014
G245BA	014
G245CA	015
G245CB	007
G246A	004
G247A	071
G248A	023
G249A	019
G250A	071
G250B	007
G251A	019
G252A	011
G252B	011
G253A	011
G253AA	009
G253AB	009
G253B	011
G254A	011
G254B	011
G256A	003
G258A	017
G259A	021
G259AA	004
G259B	054
G259BA	033
G260A	018
G261A	020
G262A	020
G263A	020
G264A	020
G265A	002
G266A	010
G301A	050
G301B	050
G301C	038
G301D	037
G302A	028
G302B	028
G303A	028
G303AA	062

Door #	HWSet #
G303AB	062
G303B	028
G304A	027
G305A	027
G306A	028
G306AA	009
G306B	028
G306BA	009
G306BB	009
G307A	028
G307AA	009
G307AAA	004
G307B	028
G307BA	023
G309A	039
G310A	020
G311A	020
G312A	019
G313A	017
G313B	007
G314A	023
G320A	020
G321A	032
G322A	021
G322AA	004
G322B	022
G322BA	033
G324A	003
G326A	017
G327A	018
G328A	020
G329A	020
G330A	019
G331A	017
G331B	007
G332A	019
G333A	011
G333B	011
G335A	011
G335AA	009
G335AB	009
G335B	011
G336A	011
G336B	011

Door #	HWSet #
H001A	082
H001B	068
H002A	099
H003A	099
H004A	066
H201A	038
H201B	037
H201DA	047
H201GA	045
H201HA	041
H201HB	042
H201HC	043
H202A	046
H202B	046
H203A	007
H203AA	026
H203B	030
H204A	027
H204AA	026
H205A	028
H205AA	026
H205B	028
H205BA	009
H205BB	009
H206A	028
H206AA	026
H206B	028
H207A	028
H207AA	030
H207B	028
H207BA	030
H207BB	030
H207CA	029
H208A	028
H208AA	009
H208B	079
H208BA	126
H208C	028
H210A	049
H210B	048
H210C	048
H210DA	004
H210DB	025
H210EA	002

Door #	HWSet #
H211AA	018
H211BA	018
H212A	019
H212B	019
H213A	019
H213B	019
H214A	017
H214B	007
H215A	023
H220A	020
H221A	020
H222A	021
H222AA	004
H222B	054
H222BA	033
H224A	003
H226A	017
H227A	018
H228A	020
H229A	020
H230A	019
H231A	017
H231B	007
H232A	019
H233A	020
H234A	020
H235A	011
H235AA	009
H235AB	009
H235B	011
H236A	011
H236B	011
H301A	036
H301B	037
H301C	038
H303A	028
H303AA	030
H303AB	109
H303B	028
H304A	028
H304AA	111
H304B	028
H304BA	009
H304BB	106

Door #	HWSet #
H305A	028
H305AA	030
H305AB	030
H305B	028
H305BA	030
H305BB	030
H306A	028
H306B	028
H308A	027
H309A	014
H310A	027
H310B	034
H311A	020
H312A	020
H313A	019
H314A	017
H314B	007
H315A	023
H320A	020
H321A	032
H322A	021
H322AA	004
H322B	022
H322BA	033
H324A	003
H326A	017
H327A	018
H328A	020
H329A	020
H330A	019
H331A	017
H331B	007
H332A	019
H333A	020
H334A	020
H335A	011
H335AA	009
H335AB	009
H335B	011
H336A	011
H336B	011

SECTION 08 80 00

GLAZING

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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
   1. Windows.
   2. Doors.
   3. Glazed curtain walls.
   4. Glazed Entrances and Storefront framing.
   5. Interior borrowed lites.

B. Related Sections:
   1. Section 07 92 00 "Joint Sealants."
   2. Section 08 11 13 "Hollow Metal Doors and Frames."
   3. Section 08 14 16 "Flush Wood Doors."
   4. Section 08 36 13 "Sectional Doors."
   5. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts."
   6. Section 08 88 10 “Fire-Rated Glass and Framing Assemblies.”
   7. Section 10 28 00 "Toilet, Bath and Laundry Accessories."

1.3 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 according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit.

~~C.~~D. D-H-NT-45, D-H-90, D-H-W-90, W-90, AND W-120 ARE RATED GLAZING ASSEMBLIES REQUIRED PER 2012 IBC TABLE 716.5; THEIR DEFINITIONS FOR THE PROJECT SHALL BE AS DEFINED BY THE 2012 IBC.

1.4 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 the following: 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. Delegated Design: Design glass, including comprehensive engineering analysis according to ICC's 2006 International Building Code by a qualified professional engineer.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

1.5 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each glass product and glazing material indicated.

C. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

D. Glazing Accessory Samples: For gaskets, sealants and colored spacers, in 12-inch (300-mm) lengths.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

F. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturers of insulating-glass units with sputter-coated, low-e coatings.

B. Product Certificates: For glass and glazing products, from manufacturer.

C. Warranties: Sample of special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. 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.

C. Source Limitations for Glass: Obtain glass from single source from single manufacturer for each glass type. Glazing for aluminum storefront, metal windows, and aluminum curtain wall shall be purchased from one manufacturer having single source responsibility.

D. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

E. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: GANA's "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

F. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
1. Comply with ANSI Z97.1 and Chapter 24, International Building Code. Tempered glass shall be supplied, whether or not shown on Drawings, where required based on area and location by Section 2406, International Building Code.

G. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Mark fire-protection-rated glazing assemblies as required by 2012 IBC. ~~Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F (250 deg C), and the fire-resistance rating in minutes~~.

H. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

I. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

J. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Install glazing in mockups specified in Section 08 41 13 "Aluminum-Framed Entrances and Storefronts", ~~Section 08 51 13 "Aluminum Windows"~~ and Section 08 44 13 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
   2. Per Section 01 40 00, an entire mockup wall assembly including masonry, window, flashings, copings, metal wall panels, insulation, glazing, sealants, etc. will be required for review by Architect before proceeding with Work.

K. Preinstallation Conference: Conduct conference at Project site.
   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review temporary protection requirements for glazing during and after installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Store glazing materials away from possible breakage, scratching and marring by unloading of other materials and work of other trades. Damage of any kind shall be cause for rejection.

C. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 PROJECT 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 below 50 deg F (4.4 deg C).
   2. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.10 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass 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 on Insulating Glass: Manufacturer's standard form in which 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 the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
   1. Warranty Period: 10 years from date of Substantial Completion.
   2. Warranty shall be signed by General Contractor, Manufacturer and Installation Subcontractor on Installation Subcontractor's letterhead.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
   1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.

2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

B. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with International Building code.
1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
3. Thicknesses listed are minimum.

C. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

D. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article.
1. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article.
2. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

E. 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 6.0 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, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

F. All exterior glazing shall be insulating glass units unless noted otherwise.

2.2 GLASS PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ACH Glass/Versalux.
2. AFG Industries, Inc.
3. General Glass Company.
4. Pilkington.
5. PPG.
6. Acceptable Substitution: Refer to Section 01 60 00 “Product Requirements.”

B. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

C. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
2. For uncoated glass, comply with requirements for Condition A.
3. For coated vision glass, comply with requirements for Condition C (other coated glass).

D. Polished Wired Glass: ASTM C 1036, Type II, Class 1 (clear), Form 1, Quality-Q6, complying with ANSI Z97.1, Class C.
1. Mesh: M3 (square).

E. Translucent Resin Panels: Varia Ecoresin, Struck Kelp, by 3form, or comparable product.
1. Size: 48 inches by 96 inches by ¼ inch thick.

2.3 INSULATING GLASS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Glass:
      a. ACH Glass/Versalux.
      b. AFG Industries, Inc.
      c. General Glass Company.
      d. Pilkington.
      e. PPG.
      f. Acceptable Substitution: Refer to Section 01 60 00 “Product Requirements.”
   2. Low-e Coatings Applicators (Soft Coat (sputtered) only - no Hard Coat allowable):
      a. Cardinal Glass Industries: www.cardinalcorp.com.
      b. Guardian Industries Corp. www.na.en.sunguardglass.com.
      c. Pittsburgh Plate Glass: www.ppg.com.
      d. Viracon, Apogee Enterprises, Inc: www.viracon.com
      e. Oldcastle Buildling Envelope: www.oldcastlebe.com.
      f. Acceptable Substitution: Refer to Section 01 60 00 “Product Requirements.”

B. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
   1. Sealing System: Dual seal, with manufacturer's standard primary and secondary.
   2. Spacer: Edgetech I.G. Inc. "SuperSpacer-Premium Plus"; www.edgetech360.com.
      a. Color: Black.
   3. Desiccant: Molecular sieve or silica gel, or blend of both.

2.4 FIRE-PROTECTION-RATED GLAZING

A. Fire-Protection-Rated Glazing, General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252 for door assemblies and NFPA 257 for window assemblies.

B. Products: Clear, flat glass; 1/4-inch (6-mm) nominal thickness.
   1. Subject to compliance with requirements, provide products by one of the following:
      a. Nippon Electric Glass Co., Ltd. (distributed by Technical Glass Products).
      b. Safti First.
      c. Schott North America, Inc.

~~2.4~~2.5 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
   1. Neoprene complying with ASTM C 864.
   2. EPDM complying with ASTM C 864.
   3. Silicone complying with ASTM C 1115.
   4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone, or, thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
   1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

~~2.5~~2.6 GLAZING SEALANTS

A. General:
   1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will 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.

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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. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
4. Sealants used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Glazing Sealants for Fire-Rated Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.

~~2.6~~2.7 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 C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. 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 the 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~~2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of 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: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Perimeter Insulation for Fire-Resistive 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~~2.9 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.

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.

D. Insulated-Glass Units:
1. Double pane glass units with elastomer edge seal.
2. Outer pane of heat strengthened glass and tinted as indicated below. Inner pane of clear heat strengthened glass.
3. Purge interpane space with dry hermetic air.
4. Total thickness of insulating glass units shall be one inch.
a. Use 5/8" at doors adjacent to glazed openings.

~~2.9~~2.10 **MONOLITHIC-GLASS TYPES**

A. Glass Type PS: Polycarbonite Sheet.
1. Thickness: ¼".
2. General Electric "Lexan MR-10" with Margard II coating.

B. Glass Type AC: Annealed Clear.
1. ¼ inch annealed glass

C. Glass Type TC: Tempered Clear.
1. ¼ inch annealed glass

D. Translucent Resin Panel.
1. Varia Ecoresin, "Connection Envy," by 3form, or comparable product by Lumicor.
2. Size: 48 inches by 96 inches by ¼ inch thick
3. Finish (front and back): Sandstone.

E. Glass Type S: Ceramic-coated spandrel glass.
1. ¼ inch annealed glass.
2. Coating: Opaque.
a. Location: Second surface.

~~2.10~~2.11 **INSULATING-GLASS TYPES**

A. Glass Types 1, 1-T, and 1-IM: Low T-Vis (South, East, and West View Windows); PPG Solarban 60 (2) Solargray + Clear; PPG Solarban 70 XL (2) Solargray + Clear; Guardian SunGuard SuperNeutral 68 (2) Gray + Clear; Acceptable Substitution.
1. Overall Unit Thickness: 1 inch (25 mm).
2. Thickness of Each Lite: 6.0 mm.
3. Outdoor Lite: Tinted Heat-Strengthened Float Glass (Tempered Where Designated "1-T" or "1-IM").
4. Interspace Content: Air
5. Indoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated "1-T," Polycarbonate Sheet In Lieu Of Heat-Strengthened Float Glass Where Designated "1-IM").
6. Visible Light Transmittance: 32% - 38%.
7. Solar Heat Gain Coefficient: < 0.28.
8. U-Value Winter: < 0.29.
9. U-Value Summer: < 0.29.

B. Glass Types 2 and 2-T: Medium T-Vis (North View Windows); PPG Solarban 67 (2) Clear + Clear; Guardian SunGuard SuperNeutral 54 (2) Clear + Clear; Acceptable Substitution.
1. Overall Unit Thickness: 1 inch (25 mm).
2. Thickness of Each Lite: 6.0 mm.
3. Outdoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated "2-T").
4. Interspace Content: Air
5. Indoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated "2-T").
6. Visible Light Transmittance: 45% - 55%.
7. Solar Heat Gain Coefficient: < 0.29.
8. U-Value Winter: < 0.29.
9. U-Value Summer: < 0.29.

C. Glass Types 3 and 3-T: High T-Vis (North Daylighting Windows); PPG Solarban 60 (2) Clear + Clear; PPG Solarban 60 (2) Starphire + Starphire; Guardian SunGuard SuperNeutral 68 (2) Clear + Clear; Acceptable Substitution.

1. Overall Unit Thickness: 1 inch (25 mm).
2. Thickness of Each Lite: 6.0 mm.
3. Outdoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated “3-T”).
4. Interspace Content: Air
5. Indoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated “3-T”).
6. Visible Light Transmittance: 68% - 80%.
7. Solar Heat Gain Coefficient: < 0.55.
8. U-Value Winter: < 0.31.
9. U-Value Summer: < 0.31.

D. Glass Types 4 and 4-T: Translucent (South, East, and West Daylighting Windows); PPG Solarban 60 (2) Solargray + Laminated; Guardian SunGuard SuperNeutral 68 (2) Gray + Laminated; Acceptable Substitution.
1. Overall Unit Thickness: 1 inch (25 mm).
2. Thickness of Exterior Lite: 6.0 mm.
3. Outdoor Lite: Tinted Heat-Strengthened Float Glass (Tempered Where Designated “4-T”).
4. Interspace Content: Air
5. Indoor Lite: 4 mm Clear Heat-Strengthened Float Glass + 0.030 Inch Vanceva “Arctic Snow” Interlayer + 4 mm Clear Heat-Strengthened Float Glass.
6. Visible Light Transmittance: 25% - 30%.
7. Solar Heat Gain Coefficient: < 0.25.
8. U-Value Winter: < 0.29.
9. U-Value Summer: < 0.29.

E. Glass Types 5 and 5-T: Transparent (North Greenhouse Windows); Clear + Clear.
1. Overall Unit Thickness: 1 inch (25 mm).
2. Thickness of Exterior Lite: 6.0 mm.
3. Outdoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated “5-T”).
4. Interspace Content: Air
5. Indoor Lite: Heat-Strengthened Float Glass (Tempered Where Designated “5-T”).

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 will 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. Comply with ANSI Z97.1 and Chapter 24, International Building Code. Tempered glass shall be supplied, whether or not shown on Drawings, where required based on area and location by Section 2406, International Building Code.

C. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

D. 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.

E. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

F. 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.

G. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

H. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
   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 (3-mm) 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.

I. 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 according to requirements in referenced glazing publications.

J. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

K. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

L. 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.

M. 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 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. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended 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 by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

A. Protect exterior 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.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. 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; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. 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 in writing by glass manufacturer.

END OF SECTION 08 80 00

SECTION 08 83 00

MIRRORS

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 the following types of silvered flat glass mirrors:
   1. Annealed monolithic glass mirrors.

B. Related Requirements:
   1. Section 08 80 00 "Glazing."
   2. Section 10 28 00 "Toilet, Bath, and Laundry Accessories" for metal-framed mirrors.

1.3 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, mounting, 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 (300 mm) square, including edge treatment on two adjoining edges.
   2. Mirror Trim: 12 inches (300 mm) long.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of mirror.

C. 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.

D. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For mirrors to include in maintenance manuals.

1.6 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.

1.7 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.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect mirrors according to 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.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.10 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 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Gardner Glass, Inc.
   2. Glasswerks LA, Inc.
   3. Guardian InGlass.
   4. Lenoir Mirror Company.
   5. Trulite Glass & Aluminum Solutions, LLC.
   6. Walker Glass Co., Ltd.

B. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.

C. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.

2.2 SILVERED FLAT GLASS MIRRORS

A. Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.

B. Annealed Monolithic Glass Mirrors: Mirror Select Quality, clear.
   1. Nominal Thickness: 6.0 mm.

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.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Franklin International.
      b. C. R. Laurence Co., Inc.
      c. Liquid Nails Adhesive.
      d. OSI Sealants; Henkel Corporation.
      e. Palmer Products Corporation.
      f. Pecora Corporation.
      g. Royal Adhesives & Sealants.
   2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Andscot Company, Inc.
b. C. R. Laurence Co., Inc.
c. Stylmark, Inc.

2. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch (9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
3. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
4. Finish: Clear bright anodized.

B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

C. Anchors and Inserts: Provide devices as required for mirror hardware installation.
1. At Gypsum Board: Provide wood blocking.
2. At Masonry: 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. Fabricate mirrors in the shop 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: Flat polished.
1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.

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 primer and bond coating where applicable.

3.3 INSTALLATION

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

B. Provide a minimum airspace of 1/8 inch (3 mm) 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 (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long at bottom channel.

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.

END OF SECTION 08 83 00

SECTION 08 88 10

FIRE-RATED GLASS AND FRAMING ASSEMBLIES

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: Fire-rated glass and framing assemblies.

B. Related Requirements:
1. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts."
2. Section 08 80 00 "Glazing."

1.3 DEFINITIONS

A. D-H-NT-45, D-H-90, D-H-W-90, W-90, AND W-120 ARE RATED GLAZING ASSEMBLIES REQUIRED PER 2012 IBC TABLE 716.5; THEIR DEFINITIONS FOR THE PROJECT SHALL BE AS DEFINED BY THE 2012 IBC.

~~2.~~1.4

~~1.3~~1.5 COORDINATION

A. Coordinate anchorage installation. 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.

~~1.4~~1.6 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
1. Include fabrication details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: Include the following:
1. Elevations of each frame type.
2. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
3. Installation details.
4. Details of each different wall opening condition.
5. Details of anchorages, joints, field splices, and connections.
6. Details of moldings, removable stops, and glazing.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification:
1. For each type of exposed finish required, in manufacturer's standard sizes.
2. Glass samples: 6 inch by 6 inch.

~~1.5~~1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency.

B. Sample Warranties: For special warranties.

~~1.6~~1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals.

~~1.7~~1.9 QUALITY ASSURANCE

A. Single Source Responsibility: Provide fire-rated glass and framing system from the same manufacturer.

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. Coordinate with installation of other components that comprise the exterior enclosure.

D. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

E. Design Wind Loads: Comply with requirements of International Building code, and not less than 30 lbs/sf (100 mph).

F. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

~~1.8~~1.10 DELIVERY, STORAGE AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished surfaces with wrapping.

C. Scratches, mars, blemishes and dents will be cause for rejection.

~~1.9~~1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of fire-rated glass and framing assemblies 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. Deterioration of metals and other materials beyond normal weathering.
   d. Water penetration through fixed glazing and framing areas.
2. Warranty Period: Five years from date of Substantial Completion.

B. Provide 10 year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

C. All warranties shall be provided in writing on the Installing Contractor's letterhead and shall include the signatures of the Installing Contractor, General Contractor and manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance for Exterior units: Comply with performance requirements specified, as determined by testing without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Fire-Rating: 45 minute assembly, tested by a nationally recognized testing laboratory.
2. Comply with AAMA/WDMA 101/i.s.2/NAFS.
3. Framed assemblies 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.
   a. Failure also includes the following:
      1) Thermal stresses transferring to building structure.
      2) Glass breakage.
      3) Noise or vibration created by wind and thermal and structural movements.
      4) Loosening or weakening of fasteners, attachments, and other components.
4. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
5. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sf of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.

6. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sf.
7. Expansion and Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
8. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
9. Design Wind Loads: Comply with requirements of International Building code, 30 lbs/sf (100 mph).
10. Allow for building deflection at storefront heads.

B. Performance for Interior units: Comply with performance requirements specified, as determined by testing without failure due to defective manufacture, fabrication, installation, or other defects in construction.
1. Fire-Rating: 90 minute assembly, tested by a nationally recognized testing laboratory.
2. Comply with AAMA/WDMA 101/i.s.2/NAFS.
3. Framed assemblies 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.
    a. Failure also includes the following:
        1) Thermal stresses transferring to building structure.
        2) Glass breakage.
        3) Noise or vibration created by wind and thermal and structural movements.
        4) Loosening or weakening of fasteners, attachments, and other components.
4. Allow for building deflection.

2.2 PRODUCTS

A. Basis of Design: Subject to compliance with requirements, provide SuperLite II-XL fire-rated insulating glass in SaftiFire GPX Framing by SaftiFirst Fire Rated Glazing Solutions, www.safti.com, or comparable products by one of the following:
1. Stiles Custom Metal, www.stilesdoors.com.
2. Technical Glass Products, www.fireglass.com,

B. Framing Members: Manufacturer's steel framing members of thickness required and reinforced as required to support imposed loads, clad with extruded aluminum in profiles matching adjacent storefront and curtainwall systems.
1. Glazing System: Retained mechanically with gaskets on four sides.
2. Glazing Plane: Match adjacent storefront system.
3. Finish: Match adjacent storefront system.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Insulating Glass Panels
1. Glass: Heat reflective glass tested in accordance with NFPA 80, NFPA 252, UL 9, UL 10B and UL 10C.
2. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
    a. Sealing System: Dual seal, with manufacturer's standard primary and secondary.
    b. Desiccant: Molecular sieve or silica gel, or blend of both.
    c. Match adjacent insulating glass units for each pane and face with regard to tint and coatings, Visible Light Transmittance, Solar Heat Gain Coefficient, U-Value Winter, and U-Value Summer.
3. Glazing: Manufacturer standard EPDM tape.

2.3 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.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) 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 A 123/A 123M or ASTM A 153/A 153M requirements.

C. Provide all required prefinished 0.032 inch thick brake metal trim to span masonry cavities, space between studs and veneer, etc., to create a finished installation matching the storefront system, whether or not shown on Drawings.

D. Provide flat fillers for installation of minimal expanding spray foam.

E. Bituminous Paint for separation of dissimilar materials: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.4 FABRICATION

A. 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.

B. 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 interior for vision glass.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible. Use of exposed fasteners is cause for rejection and replacement at no cost to Owner.

C. Provide internal drainage of glazing spaces to exterior through weep holes. End dams required.

D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

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

A. General:
   1. Comply with manufacturer's written instructions and AAMA - Metal Curtain Wall, Window Storefront and Entrance - Guide Specification Manual.
   2. Do not install damaged components.
   3. Fit joints to produce hairline joints free of burrs and distortion.
   4. Rigidly secure nonmovement joints.
   5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
   6. Seal perimeter and other joints watertight unless otherwise indicated.

7. Install flat fillers in storefront to prevent foam from entering frames. Install minimal expanding foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal/air barrier.

B. Metal Protection:
   1. Where frame 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 frame is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 08 80 00 "Glazing."

G. Install weatherseal sealant according to Section 07 92 00 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

H. Install perimeter sealants according to Section 07 92 00 “Joint Sealants” and according to manufacturer’s written instructions.
   1. Do not install sealants when ambient temperature is less than 50 degrees F. Maintain this minimum temperature during and 48 hours after installation.

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install framed assemblies to comply with the following maximum tolerances:
   1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
   2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
   3. Alignment:
      a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
      b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
      c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
   4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

3.4 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Perform the following test on representative areas of exterior fire-rated glass and framing assemblies.
   1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
      a. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.

C. Framed assemblies will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove protective material from frames. Continue to protect exposed portions of factory finished surfaces from damage by work of other trades. Any member which has a damaged surface shall be removed and replaced at no cost to Owner.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Protect installed products from damage during subsequent construction.

E. Remove and replace glazing that is broken, chipped, cracked, abraded or damaged in any way, including natural causes, accidents and vandalism during construction period.

END OF SECTION 08 88 10

SECTION 09 24 00

CEMENT PLASTERING (STUCCO)

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. Modifications to existing exterior portland cement plasterwork (stucco).

B. Related Sections:
   1. Section 07 21 00 "Thermal Insulation."
   2. Section 07 92 00 “Joint Sealants.”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work (where appropriate).
   1. Show locations, fabrication, and installation of control joints, reveals, and trim; include plans, elevations, sections, details of components, and attachments to other work.

C. Samples for Initial Selection: For each type of finish coat indicated.
   1. Trim Accessories: Full-size Sample in 10-inch (250-mm) length for each trim accessory.

D. Samples for Verification: For each color and type of finish coat indicated; 12 by 12 inches (305 by 305 mm), and prepared on rigid backing.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.5 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Exterior Plasterwork:
   1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
   2. Apply plaster when ambient temperature is greater than 40 deg F (4.4 deg C).
   3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

C. Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 METAL LATH

A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.

2.2 PLASTER MATERIALS

A. Portland Cement: ASTM C 150, Type I.
   1. Color for Finish Coats: White.

B. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

C. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
   1. Products: Subject to compliance with requirements, provide products by one of the following:

a. Bonsal American, an Oldcastle Company; Marblesil Stucco Mix.
b. California Stucco Products Corp.; Conventional Portland Cement Stucco.
c. El Rey Stucco Company, Inc., a brand of ParexLaHabra, Inc.; Premium Stucco Finish.
d. QUIKCRETE; QUIKCRETE Finish Coat Stucco, No. 1201.
e. USG Corporation; Oriental Exterior Finish Stucco.

2. Color and finish: Match existing adjacent stucco.

2.3 MISCELLANEOUS MATERIALS

A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

C. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

2.4 ACCESSORIES

A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories: Match existing adjacent.

1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
3. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
   a. Small nose cornerbead with expanded flanges; use unless otherwise indicated.
   b. Small nose cornerbead with perforated flanges; use on curved corners.
   c. Small nose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing masonry corners.
   d. Bull nose cornerbead, radius 3/4 inch (19.1 mm) minimum, with expanded flanges; use at locations indicated on Drawings.
5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, 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. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

C. Where joining with existing stucco surfaces, remove loose or damaged material by water blasting, sandblasting or mechanical wire brushing. Avoid application over irregular surfaces. Resurface, patch or level surfaces to required tolerance and smoothness with appropriate leveling materials. Refer to ASTM D-4258 and ASTM D-4261 for complete details on methods of preparing cementitious substrates for coatings

3.3 INSTALLING METAL LATH

A. Expanded-Metal Lath: Install according to ASTM C 1063.

3.4 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:
   1. Install lath-type, external-corner reinforcement at exterior locations.

C. Control Joints: Install control joints at locations indicated on Drawings.
   1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
      a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
      b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
   2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
   3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
   4. Where control joints occur in surface of construction directly behind plaster.
   5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.5 PLASTER APPLICATION

A. General: Comply with ASTM C 926.
   1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6.4 mm in 3 m) from a true plane in finished plaster surfaces, as measured by a 10-foot (3-m) straightedge placed on surface.
   2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
   3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Plaster Finish Coats: Finish to match existing adjacent stucco surface.

3.6 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.7 PROTECTION

A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 24 00

SECTION 09 29 00

GYPSUM BOARD ASSEMBLIES

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. Interior gypsum board.
2. Gypsum sheathing for exterior walls.
3. Non-structural, interior metal stud wall framing.
4. Metal channel ceiling framing systems.
5. Tile backing board.
6. Acoustic insulation.
7. Joint treatment and accessories.
8. Textured finish system, including primer.
9. Rated gypsum board enclosure for Kitchen equipment hood exhaust duct.
10. Installation of gypsum board in access door panels.

B. Related Requirements:
1. Section 01 91 15 “Facility Enclosure Commissioning” for commissioning requirements that may affect this section.
~~1.~~2. Section 05 40 00 "Cold Formed Metal Framing" for framing at exterior walls.
~~2.~~3. Section 06 10 00 “Rough Carpentry” for wood blocking.
~~3.~~4. Section 06 64 00 “Plastic Paneling.”
~~4.~~5. Section 07 84 13 "Penetration Firestopping."
~~5.~~6. Section 07 92 00 "Joint Sealants."
~~6.~~7. Section 08 31 13 “Access Doors and Frames” for gypsum board installed in access doors.
~~7.~~8. Section 09 30 00 "Tiling" for finishes applied to cementitious backer units.
~~8.~~9. Section 09 51 13 “Acoustical Panel Ceilings” for ceiling perimeter edge trim.
~~9.~~10. Section 09 72 93 “Digitally-Printed Vinyl Wall Covering.”
~~10.~~11. Section 09 91 13 "Painting."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:
1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.
2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Install mockups for each texture finish indicated.
2. Apply or install final finish indicated, including painting.
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.

1.5 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. Damaged materials shall be cause for rejection.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. During gypsum panel application and finishing maintain temperatures within the building within the range of 55 degrees F to 70 degrees F. Provide adequate ventilation to dissipate excess moisture.

D. Do not install panels that are wet, those that are moisture damaged, and those that are 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 E 119 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 E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Regional Materials: Gypsum panel products shall be manufactured within 500 miles (800 km) of Project site.

B. 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. CertainTeed Corp.
   2. Georgia-Pacific Gypsum LLC.
   3. National Gypsum Company.
   4. USG Corporation.
   5. Acceptable Substitution: See Section 01 60 00 “Product Requirements.”

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
   1. Thickness: 1/2 inch (12.7 mm), 5/8 inch (15.9 mm) and as indicated.
   2. Long Edges: Tapered.
   3. Application: All areas and applications where not indicated otherwise.

C. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.
   1. Core: 5/8 inch (15.9 mm), Type X, and as indicated.
   2. Long Edges: Tapered.
   3. Application:
      a. Corridors and high traffic areas, from floor to 8 feet above the floor.
      b. All exposed gypsum board in the gymnasium and athletic spaces.

D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; GlasRoc Tile Backer.
   b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
   c. Comparable product by National Gypsum Company of USG Corporation.
2. Core: 5/8 inch (15.9 mm), Type X.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

E. Flexible Gypsum Board: ASTM C 1396/C 1396M. 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 (6.4 mm).
   a. Apply in layers to achieve thickness indicated.
2. Long Edges: Tapered.

2.4 EXTERIOR GYPSUM BOARD

A. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; GlasRoc Sheathing.
   b. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
   c. National Gypsum Company; Gold Bond, e(2)XP.
   d. USG Corporation; Securock Glass Mat Sheathing.
   e. Acceptable Substitution: See Section 01 60 00 – Product Requirements.
2. Core: 1/2 inch (12.7 mm), regular type.
3. Application: At exterior walls and as indicated.

2.5 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. CertainTeed Corp.; FiberCement BackerBoard.
   b. James Hardie Building Products, Inc.; Hardiebacker 500.
   c. National Gypsum Company, Permabase Cement Board.
   d. USG Corporation; DUROCK Cement Board.
   e. Acceptable Substitution: See Section 01 60 00 – Product Requirements.
2. Thickness: 5/8 inch (15.9 mm), and as indicated.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
4. Application: For use where tile finishes are indicated, and as specifically indicated on the Drawings.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:
   a. Cornerbead.
   b. Bullnose bead.
   c. LC-Bead: J-shaped; exposed long flange receives joint compound.
   d. L-Bead: L-shaped; exposed long flange receives joint compound.
   e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
   f. Expansion (control) joint.
   g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Bullnose Corners: Gordon "158-90"; Fry Reglet "Radius Corner Trim"; 5/8 inch radius.
1. Required ~~at jambs of exterior windows in lieu of standard corner beads~~where indicated on drawings.

2.7 FRAMING SYSTEMS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
   2. Protective Coating: G40 hot-dip galvanized unless otherwise indicated.

C. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.
   1. Steel Studs and Runners:
      a. Minimum Base-Metal Thickness: 20 gage, unless indicated otherwise
         1) Provide 16 gage studs and runners where supporting cementitious tile backing panels.
      b. Depth: As indicated on Drawings.

D. Slip-Type Head Joints: Where indicated, provide the following:
   1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
         2) Steel Network Inc. (The); VertiClip SLD Series.
         3) Acceptable Substitution: See Section 01 60 00 – Product Requirements.

E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
   1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm), unless indicated otherwise.
   2. Depth: As indicated on Drawings.

F. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.
   1. Configuration: hat shaped.

G. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.033 inch (0.84 mm), and depth required to fit insulation thickness indicated.

H. Breakaway Clip: Aluminum Burn Clips, by ClarkDietrich, or Acceptable Substitution.

~~G.~~I. Acoustic Hangers: Model ICC Deck-Suspended Ceiling Hanger, by Kinetics Noise Control, or Acceptable Substitution.

2.8 SUSPENSION SYSTEMS

A. General: Type and size in accordance with ASTM C754.

B. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Armstrong World Industries, Inc.; Drywall Grid Systems.
      b. Chicago Metallic Corporation; Drywall Grid System.
      c. USG Corporation; Drywall Suspension System.
      d. Acceptable Substitution: See Section 01 60 00 – Product Requirements.

2.9 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.
   2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
   3. Tile Backing Panels: As recommended by panel manufacturer.

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 drying-type, all-purpose compound.
      a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Exterior Applications:
1. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint Compound for Tile Backing Panels:
1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.10 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Sound Attenuation Blankets: ASTM C 665, 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.

D. Acoustical Joint Sealant: As specified in Section 07 92 00 “Joint Sealants”.

E. Thermal Insulation: As specified in Section 07 21 00 "Thermal Insulation."

F. Vapor Retarder: As specified in Section 07 21 00 "Thermal Insulation."

2.11 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.
1. Products: Subject to compliance with requirements, provide one of the following:
a. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
b. National Gypsum Company; Perfect Spray EM Texture.
c. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.
d. Acceptable Substitution: See Section 01 60 00 – Product Requirements.
2. Texture: Orange Peel.

2.12 KITCHEN HOOD EXHAUST DUCT ENCLOSURE OPTION

A. Johns Manville (800-872-0338) UL approved grease duct enclosure "Super Firetemp T" insulation board, "Firetemp" wrap, 3M "3MU/FRD 120-05", FyreWrap "Max 2.0" or Acceptable Substitution. Install per manufacturer's requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Verify that wood or mechanically fastened steel sheet blocking for support of framed openings, plumbing fixtures, toilet partitions, toilet accessories, wall mounted door hardware, handrails, markerboards and tackboards, wall paneling and trim and joints of rigid wall coverings occurring between studs is installed before installing wallboard.
1. Blocking for support of wall mounted cabinets and shelving shall be fire treated wood.

C. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

D. Do not install exterior wall vapor barrier and finish until the exterior of the building is completely dried in and sealed. For masonry veneer construction, this includes installation of veneer and sealants at all joints and penetrations.

E. 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.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.
   1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
   2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
   3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
   4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

E. Construct 1 hour fire rated gypsum board enclosure for Kitchen equipment hood exhaust duct.

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.
   1. Spacing: 16 inches (406 mm) o.c. unless otherwise indicated.

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. Double 20 gage studs required at corners and partition intersections.

E. Install tracks (runners) 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 penetrating 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 runner track section (for cripple studs) at head and secure to jamb studs.
      a. Install two 20 gauge studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
      c. Extend jamb studs 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.

a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

F. 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 (610 mm) o.c.

G. Z-Furring Members:
1. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
2. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING 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 (1219 mm) o.c. maximum.
2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c. maximum.
3. Furring Channels (Furring Members): 24 inches (610 mm) o.c.maximum.

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. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Do not attach hangers to steel roof deck.
6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems.

F. 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.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.6 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840 and manufacturer's instructions.

B. Install vapor barrier behind gypsum board panels at wet areas.
   1. Wet areas include any wall or ceiling surface to receive tile or epoxy finish, and ceilings above the rooms to receive tile and epoxy wall finishes.

C. 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.

D. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E. 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.

F. Form control and expansion joints with space between edges of adjoining gypsum panels.

G. 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. (0.7 sq. m) 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- (6.4- to 9.5-mm-) wide joints to install sealant.

H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) 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.

I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

J. STC-Rated Assemblies: 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 C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.7 APPLYING 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. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
~~4.~~5. Omit gypsum board at frame walls that receive wood wall finish.

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 (400 mm) 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. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
1. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
2. Flexible Type: Apply in layers at curved assemblies to achieve the thickness indicated.

3.8 APPLYING EXTERIOR GYPSUM PANELS (SHEATHING)

A. Apply panels perpendicular to supports, with end joints staggered and located over supports.
1. Install with 1/4-inch (6.4-mm) open space where panels abut other construction or structural penetrations.
2. Fasten with corrosion-resistant screws.

3.9 APPLYING 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.

3.10 INSTALLING 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.

A. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
1. Install at not more than 30 feet apart on walls, ceilings and soffits.
2. Break framing behind control joints. Verify locations with Architect where not specifically shown.
3. Place at point of maximum stress due to openings, deflection or other movement in structure.

B. Bullnose corner trim required at jambs of exterior windows in lieu of standard corner beads.

3.11 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. High Crowned Joints: Excessive buildup of compound over joint, compound not feathered out beyond shoulders or improper bedding of tape is unacceptable workmanship. Check all corners with straightedge. Sand joints to flush surface correctly.

C. Starved Joints: Delayed shrinkage caused by insufficient drying time between coats of compound, insufficient compound to fill taper or over-thinning/over-smoothing of compound is unacceptable workmanship. Reapply a full cover coat of heavy-mixed compound.

D. Prefill open joints and damaged surface areas.

E. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

F. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2. Level 2: Panels that are substrate for tile.
   3. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
      a. Apply primer and texture finish.

G. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

H. Cementitious Backer Units: Finish according to manufacturer's written instructions.

I. Wall Covering: Provide Level 4 finish without primer or texture where wall is indicated to receive wall covering.

3.12 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
   1. Primer applied to gypsum panels in preparation for applying texture finish is not a substitute for primer applied in preparation for applying a paint finish coat (specified in Section 09 91 13 Painting).

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform "light orange peel" texture, matching approved mockup, and free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.13 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.14 IDENTIFICATION

A. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be permanently identified with painted stenciling located in accessible concealed floor, floor-ceiling or attic spaces, repeated 30 feet horizontally, 2 inch lettering stating: "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS".

3.15 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

SECTION 09 30 00

TILING

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. Ceramic tile.
   2. Stone thresholds.
   3. Waterproof and Crack Isolation membrane.
   4. Edge strips and corner accessories.

B. Related Sections:
   1. Section 07 92 00 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
   2. Section 09 29 00 "Gypsum Board" for cementitious backer units.

1.3 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.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width indicated.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

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 Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
   1. Provide actual physical samples. Product literature is not acceptable as samples.

D. Samples for Verification:
   1. Full-size units of each type and composition of tile and for each color and finish required.
   2. Full-size units of each type of trim and accessory for each color and finish required.
   3. Stone thresholds in 6-inch (150-mm) lengths.
   4. Metal edge strips in 6-inch (150-mm) lengths.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

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 and Trim Units: Furnish one unopened box for each type, composition, color, pattern, and size indicated.
   2. Grout: Furnish one unopened box/container for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile from one 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 one manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
   1. Stone thresholds.
   2. Waterproof and Crack Isolation membrane.
   3. Joint sealants.
   4. Cementitious backer units.
   5. Metal edge strips.

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 and adhesives in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.9 PROJECT CONDITIONS

A. Environmental Limitations:
   1. Interior Applications: 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.
   2. Exterior Applications: Maintain substrate and ambient temperatures in tiled areas between 10°C (50°F) and 35°C (95°F) during installation and for at least 7 days after completion, unless otherwise indicated in the product instructions and/or ANSI A108 installation standards

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements unless otherwise 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.

2.2 TILE PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide Dal-Tile products listed or comparable products by the following:
   1. American Olean; Division of Dal-Tile International Inc.

B. Tile Type **CT-1**, Floor application: Dal-Tile "Unity."
   1. Composition: Colorbody Porcelain.
   2. Module Size: 12 by 24 inches.
      a. When used as wall base: 6 by 12 inches, coved, or 3 by 12 inches, bull-nosed, as occurs.
   ~~2.~~3. Tile Color and Pattern: P405 Ash Grey.

C. Tile Type **CT-2**, Exterior, Floor and Accent applications: Dal-Tile "Veranda Solids."
   1. Composition: Colorbody Porcelain.
   2. Module Size: 6 1/2 by 20 inches.
   3. Tile Color and Pattern: P546 Fern.

D. Tile Type **CT-3**, Wall and Floor application: Dal-Tile "Unity."
   1. Composition: Colorbody Porcelain.
   2. Module Size: 24 by 24 inches.
      a. When used as wall base: 6 by 12 inches, coved.
   ~~2.~~3. Tile Color and Pattern: P406 Nero.

E. Tile Type **CT-4**, Floor application: Dal-Tile "Unity."
   1. Composition: Colorbody Porcelain.
   2. Module Size: 12 by 24 inches.
   3. Tile Color and Pattern: P401 Beige.

F. Tile Type **CT-5**, Wall application: Dal-Tile "Semi Gloss."
   1. Composition: Ceramic glazed.
   2. Module Size: 6 by 6 inches.
      a. When used as wall base: 6 by 6 inches, coved.
   ~~2.~~3. Tile Color and Pattern: O135 Almond.

G. Tile Type **CT-6**, Wall application: Dal-Tile "Semi Gloss."
   1. Composition: Ceramic glazed.
   2. Module Size: 6 by 6 inches.
      a. When used as wall base: 6 by 6 inches, coved.
   3. Tile Color and Pattern: Q098 Key Lime.

H. Tile Type **CT-7**, Wall application: Dal-Tile "Semi Gloss."
   1. Composition: Ceramic glazed.
   2. Module Size: 6 by 6 inches.
      a. When used as wall base: 6 by 6 inches, coved.
   3. Tile Color and Pattern: O141 Garden Spot.

I. Tile Type **CT-8**, Wall application: Dal-Tile "Semi Gloss."
   1. Composition: Ceramic glazed.
   2. Module Size: 6 by 6 inches.
      a. When used as wall base: 6 by 6 inches, coved.
   3. Tile Color and Pattern: O195 Oak Moss.

J. Tile Type **CT-9**, Exterior Wall application: Dal-Tile "Glass Mosaics."
   1. Composition: Glass.
   2. Module Size: 2 by 2 inches.
   3. Tile Color and Pattern: VG01 Oyster White.

K. Tile Type **CT-10**, Exterior Wall application: Dal-Tile "Glass Mosaics."
   1. Composition: Glass.
   2. Module Size: 2 by 2 inches.
   3. Tile Color and Pattern: VG51 Peach.

L. Tile Type **CT-11**, Interior and Exterior Wall application: Dal-Tile "Glass Mosaics."
   1. Composition: Glass.

2. Module Size: 2 by 2 inches.
3. Tile Color and Pattern: VG54 Crimson.

M. Tile Type CT-12, Wall and Floor application: Crossville “Argent.”
1. Composition: Colorbody Porcelain.
2. Module Size: 6 by 24 inches.
3. Tile Color and Pattern: A1406 Emerald City.

~~M.~~N. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
1. Bullnose.
2. Base.
3. Base Cap.
4. External Corners.
5. Internal Corners.

~~N.~~O. Grout Color: As selected by Architect from manufacturer's full range.

2.3 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch (1.5 mm) above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch (12.7 mm) or less above adjacent floor surface.

B. Granite: ASTM C 615, with honed finish.
1. Description: Uniform, medium-grained, gray stone without veining, acceptable to Architect.

2.4 WATERPROOFING AND CRACK ISOLATION MEMBRANE - INTERIOR

A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch (0.76-mm) nominal thickness.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Noble Company (The); Nobleseal TS.
b. Acceptable Substitution: See Section 01 60 00 Product Requirements.

C. Application: At floor and wall tile in showers and wet areas.

2.5 WATERPROOF MEMBRANE - EXTERIOR

A. General: Manufacturer's standard product that complies with ANSI A118.10 and ANSI A118.12, and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Premium Latex Based Waterproofing and Crack Isolation Membrane; fast setting, flexible, thin, load-bearing, waterproofing membrane system consisting of a premixed, quick-drying liquid latex.
1. Products: Subject to compliance with requirements, provide one of the following:
a. MAPEI, "Mapelastic AquaDefense".
b. Acceptable Substitution: See Section 01 60 00 Product Requirements.

C. Application: Exterior walls.

2.6 SETTING MATERIALS

A. Interior: Latex-Portland Cement Mortar (Thin Set), 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 liquid-latex additive at Project site.
3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

B. Exterior: Dry-set thin set mortar, ANSI A118.4 and ISO 13007 C2FS2P2.
   1. Flexible polymer-modified Portland cement mortar with latex additive.
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. MAPEI "Kerabond/Keralastic System."
      b. Acceptable Substitution: See Section 01 60 00 Product Requirements.
   3. Application: Exterior walls.

2.7 GROUT MATERIALS

A. Anti-Microbial Grout: ANSI A118, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Fusion Pro Single Component Grout by Custom Building Products, or comparable product by one of the following:
      a. MAPEI Corporation.
   2. Color: As selected by Architect from manufacturer's full range.

2.8 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.
   1. Minimum compressive strength of 3,700 psi.
   2. Complying with ASTM C-190, ASTM D-3931, and ASTM C-109.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
   1. Schluter-Systems: "Schiene" in stainless steel; www.schluter.com.
      ~~1.~~a. Provide with radius perforation "R" where curved tile-edge is indicated.
      b. Application: At edge of tile where bordered by carpet.
   2. Metal Ramp Profile: Schluter-Systems RENO-RAMP in stainless steel; www.schluter.com.
      a. Application: At edge of tile where bordered by sealed concrete.
   ~~2.~~3. Schluter-Systems: ""Quadec" in stainless steel; www.schluter.com.
      a. Application: At outside corners of tiled wall surfaces.

C. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
   1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
   2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

D. 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.

2.9 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 installed tile.
   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 thin-set 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. Where concrete slabs exhibit cracking unacceptable to tile installer and which have the potential to crack tile, install crack suppression/anti-fracture membrane at approximately 4-1/2 inches on both sides of slab structure.

C. 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 thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. 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.

C. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic 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. 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 trim shapes where necessary to eliminate exposed tile edges.

E. 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.

F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
   1. Floor Tile: 3/16 inch.
   2. Glazed Wall Tile: 1/16 inch (1.6 mm).
   3. Glass Mosaics: 1/8 inch.

G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

H. 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.
   2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."
   ~~2.~~3. Comply with requirements of ANSI A108.01.

I. Metal edge strips: Install for applications indicated.

J. Grout Sealer: Do not use.

K. Sound tile after setting. Replace hollow sounding units. General Contractor will also sound tile with chain during Substantial Completion observation.

3.4 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.6 CLEANING AND PROTECTING

A. 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. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

B. 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.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 09 30 00

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

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. Acoustical panels.
   2. Exposed suspension systems for acoustical panels.
   3. Open grid ceiling finishes.

B. Related Requirements:
   1. Section 07 92 00 "Joint Sealants" for acoustical sealant.
   2. Section 09 84 00 “Acoustical Components” for Ceiling Diffuser Panels installed in the acoustical panel ceiling grid system.
   3. Division 23 - Heating, Ventilating and Air Conditioning.
   4. Division 26 - Electrical.

C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.

C. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.

D. Samples for Initial Selection: For components with factory-applied color finishes.

E. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Acoustical Panel: Samples of each type, color, pattern, and texture.
   2. Exposed Suspension-System Members, Moldings, and Trim: Set of each type, finish, and color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer.

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. Acoustical Ceiling Panels: Two in-opened boxes of full-size panels of each size, type and color installed. ~~equal to 2 percent of quantity installed, but not less than 50 panel units.~~
   ~~2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.~~
   ~~3. Hold-Down Clips: Equal to 2 percent of quantity installed.~~

1.8 QUALITY ASSURANCE

A. 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 typical ceiling area in one classroom, 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.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages 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.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way. Damaged materials shall be cause for rejection.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, 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 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
   ~~1.~~2. DELETE THIS PARAGRAPH.

B. Select components, suspension and attachment systems for maximum deflection of 1:360.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations: Obtain ~~each type of acoustical ceiling panel and supporting suspension system from single source~~ ceiling panels and supporting suspension systems for the project from a single manufacturer.

B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

C. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
   1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.

2.3 ACOUSTICAL CEILING MATERIALS

A. Manufacturers:
   1. Armstrong World Industries, www.armstrong.com.
   2. USG Corporation, www.usg.com.
   3. Certainteed Corporation, www.certainteed.com.

B. Products: ~~Subject to compliance with requirements, provide one of the following:~~
   1. C1: 2 feet x 4 feet x 7/8 inch, mineral fiber, white, square edge. Class A, NRC 0.70 (minimum), CAC 40 (minimum), light reflectance 0.84 (minimum), nondirectional fissured panel.
      a. USG “Radar ClimaPlus High-CAC, High-NRC,” Model No. 22441, Grid Option D (DX/DXL).
      b. Subject to compliance with requirements, acceptable substitution from Armstrong World Industries or Certainteed Corporation.

2. C2: 2 feet x 4 feet x 1 inch, fiberglass, white, tegular edge. Class A, NRC 0.95 (minimum), CAC 20 (minimum), light reflectance 0.88 (minimum), nondirectional smooth panel.
   a. USG “Halcyon ClimaPlus,” Model No. 98245, Grid Option E (Centricitee DXT).
   b. Subject to compliance with requirements, acceptable substitution from Armstrong World Industries or Certainteed Corporation.
3. C5: 2 feet x 4 feet x ½ inch, vinyl-faced gypsum board, white, square edge. Class A or better, NRC N/A, CAC 40 (minimum), light reflectance 0.77 (minimum), non-directional smooth panel.
   a. USG “Sheetrock Lay-In Ceiling Panel ClimaPlus,” Model No. 3270, Grid Option A (DX/DXL).
   b. Subject to compliance with requirements, acceptable substitution from Armstrong World Industries or Certainteed Corporation.

~~1. **SAT-1**: 2 feet x 2 feet x 7/8 inch, mineral fiber, white, square edge. NRC 0.75, CAC 35, light reflectance 0.86 (min), nondirectional fissured panel.~~
   ~~a. Armstrong, Fine Fissured Open Plan, #1754.~~
~~2. **SAT-2**: 2 feet x 4 feet x 7/8 inch, mineral fiber, white, square edge. NRC 0.75, CAC 35, light reflectance 0.86 (min), nondirectional fissured panel.~~
   ~~a. Armstrong "School Zone Fine Fissured", #1755.~~
~~3. **SAT-3**: 2 feet x 4 feet x 1/2 inch, white, vinyl faced, CAC 40-49, fire rated, square edge, light reflectance 0.77 (min).~~
   ~~a. Armstrong "Clean Room VL Unperforated", #870.~~
   ~~b. USG "Sheetrock Brand ClimaPlus", #3270.~~
   ~~c. Certainteed "Vinylrock X", CRF finish, #1140-CRF-1.~~

2.4 METAL SUSPENSION SYSTEMS

A. Manufacturers: Subject to compliance with requirements, same manufacturer as ceiling panels.

B. Metal Suspension-System: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
   1. Die cut with interlocking components, stabilizer bars, clips, splices, perimeter moldings and hold down clips as required.
   2. Wide-Face, with prefinished 15/16-inch- (24-mm-) wide metal flanges.
   3. Structural Classification: Heavy-duty system.
   4. Face Design: Flat, flush.

C. Metal Edge Moldings and Trim: Manufacturer standard metal components and shapes.
   a. Perimeter moldings at wall/ceiling connection: shadow molding creating a reveal of ¾ inch by ¾ inch, of same material and finish as grid.
   b. Preformed perimeter trim at bullnosed wall intersections.
   c. Perimeter Edge Trim at acoustical panel ceiling “clouds”:
      1) Axiom Classic Trim by Armstrong, with pre-mitered corners, or comparable product.
         a) Straight and curved: 6 inches high.

D. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated.

E. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper. Black hanger wire is required for exposed grid with no panels.
   2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
   3. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
   4. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

F. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

G. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

H. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches (610 mm) o.c. on all cross tees.

I. Touch-up Paint: Type and color to match acoustical panels and grid.

J. Open Cell Ceilings: Where indicated, provide open suspension system with 9/16 inch face, without acoustical panels, utilizing 2 foot by 2 foot panels to create a continuous 6 inch x 6 inch cell grid.
   1. Armstrong MetalWorks Open Cell, or acceptable substitute.

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, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M, according to 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. Connect hangers directly either to structures 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. 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 the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will 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, postinstalled mechanical or adhesive anchors, or power-actuated fasteners 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 (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) 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. 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 (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). 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 a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:
   a. As indicated on reflected ceiling plans.
   b. Install panels with pattern running in one direction parallel to long axis of space.
   c. Install panels in a basket-weave pattern.
2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
   a. Install hold-down clips on panels within 10 feet of an exterior door.
7. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions. Install bull nose perimeter trim at bull nosed wall intersections.
8. Install black hanger wires where grid is exposed with no panels inserted.

3.4 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

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. 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 64 00

WOOD FLOORING

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. Field-finished sports activity wood flooring with game markings.

B. Related Sections:
   1. Section 03 30 00 "Cast in Place Concrete" for recessed concrete subfloor surface and depressions for deep floor sockets.
   2. Section 11 66 23 "Athletic Equipment" for equipment inserts.
   3. Division 26 - Electrical.

1.3 SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For each type of floor assembly and accessory. Include plans, elevations, sections, details, and attachments to other work. Include expansion provisions, trim details and game markings.

D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.

E. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

F. Submit MFMA certificate that products meet or exceed association requirements.

G. Submit MFMA Recommendations for preparation, finish and testing of concrete subfloor surfaces to receive wood flooring.

H. Manufacturer and Installer qualifications.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be an authorized agent of the flooring systems manufacturer and shall exhibit local experience to General Contractor, Owner and Architect.

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.

C. Build 16 feet x 16 feet mockup of typical flooring area, including base and shoe moldings.
   1. To set quality standards for sanding and application of field finishes, prepare finish mockup of floor 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. Approved mockups may become part of the completed Work.

D. Floor system shall be installed in complete conformance with flooring materials manufacturer's requirements for temperature, humidity and ventilation before, during and after installation.

E. Manufacturer's Representative and Installer shall review the conditions, including condition of wood flooring materials delivered to the site, prior to installation. Installation shall not begin until all conditions of the Work are completely acceptable to them.

F. Low-Emitting Materials: Wood flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.5 COORDINATION

A. Coordinate with the work of Section 03 30 00 “Cast-In-Place Concrete” for acceptable subfloor.
   1. Concrete Finish: Steel troweled.
   2. Concrete tolerance: Floor flatness shall not deviate more than 1/8 inch in radius of 10 feet.
   3. Comply with MFMA Recommendations for preparation, finishing and testing of concrete subfloors.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood flooring materials in unopened cartons or bundles. Material shall not be delivered or installed until all other work in area is completed.

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.

1.7 PROJECT CONDITIONS

A. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

B. Material Conditioning:
   1. Environmental Conditions: With the permanent HVAC system in operation, maintain an ambient temperature between 65 and 75 deg F (18 and 24 deg C) and relative humidity planned for building occupants in spaces to receive wood flooring for a minimum of 3 weeks prior to installation and during installation.
   2. Move wood flooring into spaces where it will be installed, a minimum of 3 weeks prior to installation.
      a. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
      b. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as space where it is to be installed.

C. After installation, maintain environmental conditions until delivery of project to the Owner.

PART 2 - PRODUCTS

2.1 SPORTS ACTIVITY WOOD FLOORING

A. Cushioned Wood Sports Flooring, Basis of Design: Subject to compliance with requirements, provide Robbins, Inc; "Bio-Cushion LP" or comparable product by one of the following:
   ~~1. Robbins, Inc; "Bio-Cushion LP": www.robbinsfloor.com.~~
   ~~2.~~1. Connor AGA; ~~"Neo Shok":~~ www.connorfloor.com.
   ~~3.~~2. Action Floor Systems, Inc; ~~"Action Thrust I":~~ www.actionfloors.com.
   ~~4.~~3. Aacer, Inc~~; "AacerFlex":~~ www.aacerflooring.com.
   ~~5.~~4. ~~Comparable product by~~ Horner.
   ~~6.~~5. Acceptable Substitution: See Section 01 60 00 – Product Requirements.

B. Materials:
   1. Surface:
      a. Species: Northern Hard Maple.
      b. Grade: Second and better.
      c. Cut: ~~Edge grain~~ Plain sawn.
      d. Moisture Content: 6 to 7 percent.
      e. Actual Thickness: 25/32 inch.
      f. Actual Width: ~~1-1/2~~ 2 1/4 inches.
      g. Edge: Tongue and Groove.
      h. End: End matched.

i. Length: Random, minimum of 9 inches.

2. Subflooring: ~~23/32~~ 2 layers 15/32 inch thick plywood, APA Rated Sheathing, Span Rating of 32/16~~ with tongue and groove edges~~; Exposure 1, sanded,~~ preservative treated~~.

3. Cushion Blocks: 7/16 inch thick resilient pads, rubber material, sealed air channels for resiliency; compressible to 1/16 inch under a 40 psi load with full and immediate recovery.

~~4. Sleepers and Shims: Softwood lumber, pressure treated for moisture protection, 2 x 4 inch size.~~

C. Performance Requirements:

1. Floor system to have been tested and passed requirements of DIN 18032, Part II as follows:

a. Shock Absorption: Minimum 50 ~~57~~ percent.

b. Ball Return: Minimum 96 percent

c. Deflection: Minimum 1.9 percent.

d. Area Deflection: (Isolation of Impact) less than 22 percent.

D. Accessories:

1. Ventilating Base: Molded rubber, ~~6~~ 4 inches high with a ~~2~~ 3 inch toe, 3/8 inch thick, ventilating type, with adhesives and accessories, black.

~~2. Perimeter Springs: Flat spring steel, leaf shaped, with attachment clips, 0.093 x 1 x 9 inch size.~~

2. Aluminum Threshold Plates: ¼ inch thick, extruded, anodized finish aluminum, recommended by manufacturer.

~~3.~~a. Provide Model 755, ¼ inch by 5 inch, by Genotek, or comparable product by Zero International.

~~4.~~3. Marking Paint and Stains: Compatible with floor finish materials; colors as selected by Architect.

~~5.~~4. Floor Finish: ~~Basic Coatings, Inc.; "Streetshoe 275"; www.basiccoatings.com~~MFMA Group III Seals and Finishes, oil based.

~~6.~~5. Vapor Retarder: ASTM D 4397, polyethylene sheet not less than 6.0 mils (0.15 mm) thick.

E. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.

F. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines: Wood Flooring."

G. Cork Expansion Strip: Composition cork strip.

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. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

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

3.2 PREPARATION

A. Concrete Slabs: Grind high spots and fill low spots to produce a maximum 1/8-inch (3-mm) deviation in any direction when checked with a 10-foot (3-m) straight edge.

1. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

B. Remove coatings, including curing compounds, and other substances on substrates that are incompatible with wood flooring installation and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

C. 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. Installation shall not begin until all conditions of the Work are acceptable to the Manufacturer's Representative and manufacturer's approved Installer.

B. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."

C. Solid-Wood Flooring: Blind nail or staple flooring to substrate.

D. Sports Activity Wood Flooring:

1. Install in accordance with manufacturer's, MFMA, and NOFMA instructions; ~~predrill and blind nail to sleepers~~.
2. Install subflooring in accordance with manufacturer's instructions.
   a. Install layers in opposing directions, with offset in joints.
~~2.~~3. Lay flooring parallel to length of room areas. Verify alignment as work progresses.
~~3.~~4. Expansion rows will be evenly distributed with each row of flooring, with each space not exceeding 1/64" (0.4mm).
~~4.~~5. Arrange flooring with end matched grain set flush and tight.
~~5.~~6. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar; provide divider strips and transition strips in accordance with flooring manufacturer's recommendations and as indicated.
~~6.~~7. Install edge strips at unprotected or exposed edges, and where flooring terminates.
~~7.~~8. Secure edge strips before installation of flooring with stainless steel screws.
~~8.~~9. Install flooring tight to floor access covers.
~~9.~~10. Install flooring under movable partitions without interrupting floor pattern.
~~10.~~11. Provide ~~1~~ 1 ½ inch expansion space at fixed walls and other interruptions.
~~11. At cushioned sleepers, install springs in perimeter expansion space at 24 inches oc.~~
12. Rubber pads shall be omitted from plywood panels which are located beneath bleacher stack areas. Fill void between concrete substrate and initial layer of plywood with a solid sheet of plywood. In area of bleachers in extended position, provide plywood between rubber pads of a thickness which will restrict compression of the flooring system to not more than 1/8 inch.
13. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside and outside corners.
14. Install floor sockets to a depth sufficient to ensure flush top surface with floor surface.
15. Install aluminum threshold plates securely at doors and openings where wood floor meets other floor materials.

3.4 FIELD FINISHING

A. Mask off adjacent surfaces before beginning sanding.

B. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than ~~one~~ two coats of floor sealer and ~~four~~ two 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.~~

C. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

1. Apply finish in accordance with floor finish manufacturer's instructions.
2. Comply with applicable recommendations in NWFA's "Installation Guidelines: Wood Flooring."

D. Sand flooring to smooth even finish with no evidence of sander marks, drum stop marks, gouges, streaks or shiners. Take precautions to contain dust. Remove dust by vacuum.

1. Apply first coat, allow to dry, then buff lightly with steel wool to remove irregularities.

2. Vacuum clean and wipe with damp cloth before applying succeeding coat.
3. Lightly buff between coats with steel wool and vacuum clean before applying succeeding coat.
4. Apply colored game lines 2 inches wide and logo to layout indicated on Drawings.
5. Apply last coat of finish.

E. 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 65 16

RESILIENT FLOORING

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. Resilient tile flooring.
   2. Resilient base.
   3. Installation accessories.
   4. Providing floor transitions for Section 09 68 00 carpet.
   5. ~~Resilient flooring in elevator.~~

B. Related Sections:
   1. Section 03 30 00 "Cast-in-Place Concrete" for restrictions on curing compounds for concrete slabs and floors.
   2. Section 14 21 00 "Elevators."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of flooring. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   1. Show details of special patterns.
   2. Show game lines and markings.

C. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections or full size units.

D. Samples for Initial Selection: For each type of resilient flooring indicated.
   1. Architect reserves the right to select colors from more than one product manufacturer. Maximum anticipated colors per product: Three.

E. Samples for Verification: For each different color and pattern of resilient flooring required.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of resilient flooring 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. Floor Tile: Furnish two unopened boxes of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient flooring installation and seaming method indicated.
   1. Engage an installer who employs workers for this Project who are trained or certified by resilient flooring manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store resilient flooring 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 (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient flooring during the following time periods:
   1. 72 hours before installation.
   2. During installation.
   3. 72 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 (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during resilient flooring installation.

D. Close spaces to traffic for 72 hours after resilient flooring installation.

E. Install resilient flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient products, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Low-Emitting Materials: Resilient products shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 RESILIENT FLOOR TILE

A. Resilient Tile – **RES-1**
   1. Basis of Design: Subject to compliance with requirements, provide UPOFLOOR, Mosaic Collection ~~Versa Quartz manufactured by Procedo Flooring~~, or comparable product by one of the following:
      a. Acceptable Substitution: See Section 01 60 00 “Product Requirements.”
   2. Tile Standard: ASTM F 1066, Class 2, through-pattern tile.
   3. Performance Requirements:
      a. Critical Radiant Flux: > 1.08 W/cm^2, ASTM E 648
      b. Smoke Density: < 450, ASTM E 662.
      c. Hardness: > 65 Shore D, ASTM E 2240.
      d. Slip Resistance: ADA Compliant, ASTM D 2047.
      e. Chemical Resistance: Excellent, ASTM F 925.
      f. Modified Static Load: 3,500 PSI, ASTM F 970.
      g. Abrasion Resistance: Excellent, ASTM F 510.
   4. Wearing Surface: Smooth.
   5. Thickness: 0.100 inch (2.5 mm).
   6. Size: 24 by 24 inches (305 by 305 mm).
   7. Colors and Patterns: As selected by Architect from full range of industry colors.

B. Resilient Tile – ~~**RT**~~ **RES-2**
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Mondo Ramflex.
         1) Format: 36” x 36” Adhered Tiles.
         2) Thickness: 10 mm.
      b. Robbins Galaxy Classic.
         1) Format: 24” x 24” Loose Laid “iLock” Tiles.
         2) Thickness: 10 mm.
   2. Colors and Patterns: As selected by Architect from manufacturer’s full range.
   3. Application: Weight Room, and as indicated.

2.3 THERMOSET-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
   2. Flexco.
   3. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
   1. Style and Location:
      a. Style A, Straight: Provide in areas with carpet.
      b. Style B, Cove: Provide in areas with resilient flooring.

C. Thickness: 0.125 inch (3.2 mm).

D. Height: 4 inches (102 mm), and as indicated.

E. Lengths: Coils in manufacturer's standard length.

F. Colors: As selected by Architect from full range of industry colors.

2.4 ACOUSTICAL UNDERLAYMENT

A. Flat resilient underlayment sheet.

B. Basis of Design: Subject to compliance with requirements, provide QTscu Sount Insulation manufactured by Encore International, or comparable product by one of the following.
   1. DURA Undercushions Ltd.
   2. Kinetics Noise Control.

C. Application: Where indicated.

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 resilient flooring manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient flooring and substrate conditions indicated.
   1. Adhesives shall have a VOC content of 50 g/L or less.
   2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Seamless-Installation Accessories:
   1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
   2. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.
      a. Bonding compound shall have a VOC content of 510 g/L or less.
      b. Bonding compound shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

E. Transitions:
   1. At carpet/ceramic tile transitions, Tile/Carpet Joiner, install Roppe Vinyl #177 159 or Acceptable Substitution. Color to be selected by Architect from full range of colors.
   2. At carpet/concrete transitions, Glue Down Carpet Edge, Roppe Rubber #38.
   3. At RES-1/concrete transitions, Reducer Strip, Roppe Rubber #21.
   4. At RES-1/Fluid-Applied Flooring transitions, Reducer Strip, Roppe Rubber #59.
   5. At RES-2/concrete transitions, Reducer Strip, Roppe Rubber #22.
   6. Basis of Design: Products indicated are by model number are by Roppe. Comparable products by other manufacturers will be considered.

7. Color: As selected by Architect from full range of colors.

F. Crack Suppression/Anti-Fracture Membrane Over Cracks in Concrete Slabs: Mapei "PRP M19", Dal Tile "Dal-Seal CIS" or Acceptable Substitution.

G. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient flooring manufacturer.

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 flooring.
   2. Proceed with installation only after unsatisfactory conditions have been corrected. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to resilient products manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.
   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 resilient flooring manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient flooring 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: Proceed with installation only after substrates pass testing according to resilient flooring manufacturer's written recommendations, but not less stringent than the following:
      a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
      b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 60 percent relative humidity level.

C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface. Build up floor filler to level flooring materials of different thickness for a distance of approximately 3 feet from transition. Where concrete slabs exhibit cracking unacceptable to resilient flooring installer and which have the potential to telegraph through resilient flooring, install crack suppression/anti-fracture membrane at approximately 4-1/2 inches on both sides of slab fracture. No extras allowed for "additional required excessive preparation".

D. Leveling of major uneven concrete floor joints or other irregularities by bush hammering or grinding and filling will be by Contractor.

E. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

F. Install acoustical underlayment, where indicated, in compliance with requirements of manufacturer of underlayment and resilient flooring.

G. Do not install resilient products until it is the same temperature as the space where it is to be installed.
   1. At least 72 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.

H. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

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 square with room axis.

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 with grain running in one direction.

D. Install acoustical underlayment per manufacturer's instructions.

E. 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.

F. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

G. 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.

H. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor 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.

I. Adhere floor tiles to flooring 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.

J. At movable partitions, install flooring under partitions without interrupting floor pattern.

3.4 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. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) 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 (76 mm) in length.
      a. Miter or cope corners to minimize open joints.

I. Set cove in sealant to seal joint watertight at flooring in toilet rooms, custodial closets and food preparation areas and as directed by Health Department.

3.5 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. 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.

3.6 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient flooring.

B. Perform the following operations immediately after completing resilient flooring 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 resilient flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from flooring surfaces before applying liquid floor polish.
   1. Apply two base coats and one finish coat of liquid floor sealer.

E. Cover resilient flooring until Substantial Completion.

END OF SECTION 09 65 16

SECTION 09 65 66

RESILIENT ATHLETIC FLOORING

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 requirements for Resilient Athletic Flooring. Final scope of systems installed will be determined by Bid Alternate. Not all products described in this section will be required. Refer to Section 01 23 00 “Alternates” for additional requirements. Systems described include:
   1. Poured Urethane Flooring.
   2. Rubber sheet flooring.
   3. Rubber floor tile.
   4. Game-line markings and flooring accessories.
   ~~4.~~5. Aerobic Flooring (Marley Floor).

B. Related Requirements:
   1. Section 01 23 00 “Alternates” for additional requirements affecting Work of this section.
   2. Section 09 65 13 "Resilient Base and Accessories" for wall base and accessories installed with resilient athletic flooring.

1.3 COORDINATION

A. Coordinate layout and installation of flooring with floor inserts for gymnasium equipment.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show installation details and locations of the following:
   1. Border tiles.
   2. Floor patterns.
   3. Layout, colors, widths, and dimensions of game lines and markers.
   4. Locations of floor inserts for athletic equipment installed through flooring.
   5. Seam locations for sheet flooring.

C. Samples: For each exposed product and for each type, color, and pattern specified, 6-inch square in size and of the same thickness indicated for the Work.
   1. Game-Line- and Marker-Paint Samples: Include Sample sets showing game-line- and marker-paint colors applied to flooring.
   2. Seam Samples: For each vinyl sheet flooring color and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

D. Samples for Initial Selection: For each type of resilient athletic flooring.
   1. Game-Line and Marker Paint: Include charts showing available colors and glosses.

E. Samples for Verification: For each type, color, and pattern of flooring specified, of same thickness and material indicated for the Work.
   1. Game-Line- and Marker-Paint Samples: Include Sample sets showing game-line- and marker-paint colors applied to flooring.
   2. Seam Samples: For each vinyl sheet flooring color and pattern required; with seam running lengthwise and in center of Sample applied to a rigid backing and prepared by Installer for this Project.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For sheet vinyl flooring Installer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resilient athletic flooring to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Flooring Installer Qualifications: An experienced installer who has completed flooring installations using seaming methods indicated for this Project and similar in material, design, and extent to that indicated for this Project; who is acceptable to manufacturer; and whose work has resulted in installations with a record of successful in-service performance.

1.8 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 storing.

B. Store materials to prevent deterioration.
   1. Store tiles on flat surfaces.
   2. Store rolls upright.

1.9 FIELD CONDITIONS

A. Adhesively Applied Products:
   1. Maintain temperatures during installation within range recommended in writing by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive flooring 48 hours before installation, during installation, and 48 hours after installation unless longer period is recommended in writing by manufacturer.
   2. After postinstallation period, maintain temperatures within range recommended in writing by manufacturer, but not less than 55 deg F or more than 95 deg F.
   3. Close spaces to traffic during flooring installation.
   4. Close spaces to traffic for 48 hours after flooring installation unless manufacturer recommends longer period in writing.

B. Install flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. FloorScore Certification: Resilient athletic flooring shall be certified under the RFCI FloorScore program.

B. Low-Emitting Materials: Flooring system elements shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
   1. **Alternate 20A: Adhered Rubber Sheet System** (Mondo USA, Inc., www.mondoworldwide.com).
      a. Price One: Running Track and surrounding area for use with spiked running shoes (RAF-1 in two colors).
         1) Mondo Super X Performance.
         2) Thickness: 12 mm.
         3) Color-1: P58 Cognac.
         4) Color-2: P14 Dark Green.
      b. Price Two: Same as Price One, but in 13.5 mm thickness (13.5 mm thickness is eligible for IAAF certification).
      c. Price Three: School mascot.
         1) Water-jet inlay of Color-2 on Color-1.
      d. Price Four: Weight Room enclosure for use without spiked running shoes (RAF-2 in one color).
         1) Mondo Ramflex.
         2) Format: Adhered 6’-0” wide rolled goods.
         3) Thickness: 10 mm.
         4) Color: G920 Dark Maple.
   2. **Alternate 20B: Adhered Rubber Sheet System** (Robbins Sports Surfaces, www.robbinsfloor.com).

a. Price One: Running Track and surrounding area for use with spiked running shoes (RAF-1 in two colors).
   1) Robbins Durathon Elite Track.
   2) Thickness: 12 mm.
   3) Color-1: Yellow.
   4) Color-2: Green.
b. Price Two: Same as Price One, but in 13.5 mm thickness (13.5 mm thickness is eligible for IAAF certification).
c. Price Three: School mascot.
   1) Water-jet inlay of Color-2 on Color-1.
d. Price Four: Weight Room enclosure for use without spiked running shoes (RAF-2 in one color).
   1) Robbins Galaxy Classic.
   2) Format: 24" x 24" Loose Laid "iLock" Tiles.
   3) Thickness: 10 mm.
   4) Color: 35% Color Category, Green-LT Brown-Tan.

3. **Alternate 20C: Poured Urethane System** (Beynon, www.beynonsports.com).
   a. Price One: Running Track and surrounding area for use with spiked running shoes (RAF-1 in two colors).
      1) Beynon BSS 1000 with Hobart Texture.
      2) Thickness: 10 mm.
      3) Color-1: Beige.
      4) Color-2: Racquet Green.
   b. Price Two: Same as Price One, but in 13 mm thickness (13 mm thickness is eligible for IAAF certification).
   c. Price Three: School mascot.
      1) Painted and spray-sealed.
   d. Price Four: Weight Room enclosure for use without spiked running shoes (RAF-2 in one color).
      1) Beynon PolyTurf.
      2) Format: Poured.
      3) Thickness: 10 mm.
      4) Color: Beige.
   e. Price Five: Same as Price Four, but in 13 mm thickness (13 mm thickness is eligible for IAAF certification).
4. **Alternate 20D: Padded Poured Urethane System** (Robbins Sports Surfaces, www.robbinsfloor.com).
   a. Price One: Running Track and surrounding area for use with spiked running shoes (RAF-1 in two colors).
      1) Robbins Pulastic SP 140.
      2) Thickness: 14 mm.
      3) Color-1: Sand Beige.
      4) Color-2: Green Oxide.
   b. Price Two: Same as Price One, but in 16 mm thickness (Pulastic SP 160 Track, 16 mm thickness is eligible for IAAF certification).
   c. Price Three: School mascot.
      1) Painted and spray sealed.
   d. Price Four: Weight Room enclosure for use without spiked running shoes (RAF-2 in one color).
      1) Same as Alternate 20B ~~C~~, Price Four.

2.2 AEROBIC FLOORING ("MARLEY FLOOR") – RAF-3

A. Basis of Design: Subject to compliance with requirements provide "Performance Floor" by Rosco, www.roscodancefloors.com.

B. Triple-layer construction vinyl sheet with felted backing.

C. Accessories:

1. Adhesives for permanent installation.
2. Provide welding threads to match wear layer.

~~C.~~D. Application: Dance floor beneath wrestling mats in Wrestling/Aerobics A102.

~~2.2~~2.3 ACCESSORIES

A. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by flooring manufacturer.

B. Adhesives: Water-resistant type recommended in writing by manufacturer for substrate and conditions indicated.
   1. VOC Content: Not more than 50 g/L.

C. Game-Line and Marker Paint: Complete system including primer, if any, compatible with flooring and recommended in writing by flooring and paint manufacturers for use indicated.
   1. VOC Content: Not more than 150 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, 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.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of flooring.

B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended in writing by manufacturer. Do not use solvents.

C. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

D. Move flooring and installation materials into spaces where they will be installed at least 48 hours in advance of installation unless manufacturer recommends a longer period in writing.
   1. Do not install flooring until it is the same temperature as space where it is to be installed.

E. Sweep and vacuum clean substrates to be covered by flooring immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 FLOORING INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions.

B. Scribe, cut, and fit tile and sheet flooring to butt neatly and tightly to vertical surfaces, equipment anchors, floor outlets, and other interruptions of floor surface.

C. Extend flooring into toe spaces, door reveals, closets, and similar openings unless otherwise indicated.

D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating subfloor markings on flooring. Use nonpermanent, nonstaining marking device.

3.4 FLOOR TILE INSTALLATION

A. Lay out 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 square with room axis.

B. Discard broken, cracked, chipped, or deformed tiles.

C. Tile Matching: Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged if so numbered.
   1. Lay tiles with grain running in one direction.

D. Adhere products to substrates using a full spread of adhesive applied to substrate to comply with adhesive and flooring manufacturers' written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
   1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.5 SHEET FLOORING INSTALLATION

A. Unroll sheet flooring and allow it to stabilize before cutting and fitting.

B. Lay out sheet flooring as follows:
   1. Maintain uniformity of flooring direction.
   2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
   3. Match edges of flooring for color shading at seams.
   4. Locate seams according to approved Shop Drawings.

C. Adhere products to substrates using a full spread of adhesive applied to substrate to comply with adhesive and flooring manufacturers' written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
   1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

D. Vinyl Sheet Flooring Seams: Prepare and finish seams to produce surfaces flush with adjoining flooring surfaces.
   1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and use welding bead to permanently fuse sections into a seamless flooring.
   2. Chemically Bonded Seams: Comply with ASTM F 693. Seal seams to prevent openings from forming between cut edges and to prevent penetration of dirt, liquids, and other substances into seams.

3.6 POURED URETHANE INSTALLATION

A. Comply with manufacturer written instructions.

3.7 GAME LINES AND MARKERS

A. Mask flooring at game lines and markers, and apply paint to produce sharp edges. Where crossing, break minor game line at intersection; do not overlap lines.

B. Apply game lines and markers in widths and colors according to requirements indicated on Drawings.

3.8 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing flooring installation:
   1. Remove adhesive and other blemishes from flooring surfaces.
   2. Sweep and vacuum flooring thoroughly.
   3. Damp-mop flooring to remove marks and soil after time period recommended in writing by manufacturer.

B. Protect flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
   1. Do not move heavy and sharp objects directly over flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 09 65 66

SECTION 09 67 00

FLUID-APPLIED FLOORING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fluid-applied flooring and base.

B. Divider strips and accessories.

C. Crack suppression/anti-fracture membrane over cracks in concrete slabs.

1.2 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 07 92 00 - Joint Sealers.

1.3 REFERENCE STANDARDS

A. ASTM D 570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2005).

B. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics; 2010.

C. ASTM D 695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2008.

D. ASTM D 905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008.

E. ASTM D 4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2010.

F. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.

G. ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.

H. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2009a.

1.4 SUBMITTALS

A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

B. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

C. Samples: Submit two samples, 2 inch by 2 inch in size illustrating color and pattern for each floor material for each color specified.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing work of this section with minimum three years experience, and approved by manufacturer.

C. Supervisor Qualifications: Trained by product manufacturer, under direct full time supervision of manufacturer's own foreman.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.8 FIELD CONDITIONS

A. Maintain minimum temperature in storage area of 55 degrees F.

B. Store materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. A. Fluid-Applied Flooring:
1. BASF Construction Chemicals, Inc: "Degaclad CF"; www.building systems.BASF.com
   a. DeGussa/Silikal; "Degadur R61, flake": www.evonik.com. (Areas other than Kitchen).
   b. DeGussa/Silikal; "Degadur R61, quartz broadcast": www.evonik.com. (Kitchen).
2. Duraflex Cryl-a-Chip SL (Areas other than Kitchen...
3. Duraflex Cryl-a-Quartz SL (Kitchen).

B. 4. Acceptable Substitution: See Section 01600 - Product Requirements

2.2 MATERIALS

A. Fluid-Applied Flooring: Methyl Methacrylate, two component, thermosetting.
1. Non-slip Surfacing: Mineral, color as selected.
2. Tensile Strength: 1,050 psi, when tested in accordance with ASTM D 638.
3. Compressive Strength: 6,000 psi, when tested in accordance with ASTM D 695.
4. Water Absorption: 0.04 percent, when tested in accordance with ASTM D 570 for 24 hr.
5. Hardness (Shore D): 70, when tested in accordance with ASTM D2240.
6. Mildew Resistance: No growth. Note: An epoxy system is not an acceptable substitution at this time.

2.3 ACCESSORIES

A. Divider Strips: Brass.

B. Crack Suppression/Anti-Fracture Membrane over Cracks in Concrete Slabs: Mapei "PRP M19", Dal Tile "Dal-Seal CIS" or Acceptable Substitution.

C. Transition Strips at Carpet: Metal Edge Strip, Schluter-SCHIENE ~~Roppe #159 carpet/tile joiner~~.

~~C.~~D. Transition at concrete: Reducer Strip, Roppe Rubber #24.

~~D.~~E. Cant Strips: Molded of flooring resin material.

~~E.~~F. Subfloor Filler: White premix latex; or type recommended by flooring material manufacturer.

~~F.~~G. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 - PART 3 EXECUTION

3.1 EXAMINATION

A. Do not proceed with installation until unsatisfactory conditions have been corrected. Conditions shall be corrected by Contractor using self-leveling underlayment. No extras will be allowed for "additional required preparation."

B. Verify that substrates are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

C. Where concrete slabs exhibit cracking unacceptable to fluid applied flooring installer and which have the potential to telegraph through fluid applied flooring, install crack suppression/anti-fracture membrane at approximately 4-1/2 inches on both sides of fracture.

D. Vacuum clean substrate.

E. Apply primer to surfaces required by flooring manufacturer.

3.3 INSTALLATION - STRIPS

A. Install cant strips at base of walls where flooring is to be extended up wall as base.

3.4 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness indicated for system described, or required by manufacturer.

C. Finish to smooth level surface.

D. Install flooring in recessed type floor access covers.

E. Cove at vertical surfaces to height of 6 inches, unless noted otherwise. Round all interior and exterior corners.

F. Where indicated, broadcast glass beads at 1 lb per 100 square feet of floor surface.

G. Where substrate is interrupted by expansion or control joints, provide joint in resinous flooring to comply with details recommended by resinous flooring manufacturer. Apply joint sealants to comply with requirements of resinous flooring manufacturer.

H. Cure in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.

3.5 TESTING

A. The Owner will engage the service of an independent testing laboratory to sample materials being used. If test results show materials being used do not comply with specified requirements, Contractor may be directed to remove non-complying materials, pay for testing and reapply flooring materials to surfaces with rejected materials.

3.6 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until cured.

END OF SECTION 09 67 00

SECTION 09 68 13

CARPETING

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. Carpet.
2. Walk-Off Mat (Carpet Tile).
3. Installation of edge strips and transition strips provided by 09 65 16 “Resilient Flooring.”

B. Related Requirements:
1. Section 09 65 16 "Resilient Flooring" for resilient wall base and accessories installed with carpet tile.

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 installation recommendations for each type of substrate.

B. Shop Drawings: Show the following:
1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
2. Carpet tile type, color, and dye lot.
3. Seam locations, types and methods.
4. Type of subfloor.
5. Type of installation.
6. Pattern of installation.
7. Pattern type, location, and direction.
8. Pile direction.
9. Type, color, and location of insets and borders.
10. Type, color, and location of edge, transition, and other accessory strips.
11. Transition details to other flooring materials.

C. Samples: 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. Carpet: 12-inch by 18-inch sample.
3. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
4. Carpet Seam: 6-inch (150-mm) Sample.
5. Mitered Carpet Border Seam: 12-inch- (300-mm-) square Sample. Show carpet pattern alignment.

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 and 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.

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. Roll: Uncut full-roll-width pieces, for each type of carpet installed:
      a. Equal to one percent.
      b. But not less than the equivalent of eight square yards.
      c. Extra materials shall be 6 foot width only. If carpet used in 12 feet wide, cut carpet to 6 foot width before delivering to Owner.
   2. Tile: Two unopened cartons of full-size units, for each style and type of carpet tile used.

1.7 QUALITY ASSURANCE

A. Work of this section shall comply with requirements of the "Standard for Installation of Commercial Carpet" by the Carpet and Rug Institute (CRI).

B. Installer Qualifications: An experienced installer with demonstrable experience with similar project of at least five years.

C. Fire-Test-Response Ratings: Where indicated, provide carpet identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104.

1.9 FIELD CONDITIONS

A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet 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 or carpet tiles, install carpet or carpet tiles before installing these items.

1.10 WARRANTY

A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 15 percent loss of face fibers, edge raveling, snags, runs, loss of seam integrity, delamination, loss of adhesion to the floor, zippering, and moisture penetration, and the following:
      a. Wear: Lifetime of carpet. No more than 10% face yarn loss by weight normal use.
      b. Static: Lifetime of carpet.
      c. Edge Ravel: Lifetime of carpet.
         1) Guaranteed no edge ravel in normal use (no seam sealers required).
      d. Delamination: Lifetime of carpet.
         1) Guaranteed no delamination in normal use (no chair pads required).
      e. Tuft Bind: Lifetime of carpet. Guaranteed not to zipper, wet or dry.
      f. Stain Resistance: Lifetime stain warranty and a 10 year light fastness and atmospheric contaminant warranty.

B. Special Project Warranty for Carpet and Carpet Tiles: Manufacturer and Installer agree to repair or replace components of carpet 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, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
3. Warranty Period: 2 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WALK-OFF MAT (CARPET TILE) – CPT-A

A. Walk-Off Mat
1. Basis of Design: Subject to compliance with requirements, provide Tandus “Geo Tile” or comparable product by the following.
   a. Mannington.
2. Product: Rubber reinforced Needlepunch Textile with geometric pattern.
   a. Tile Size: 18 inches by 18 inches.
   b. Pile Height: 0.25 inches.
   c. Face Yarn: 100 percent premium polypropylene, solution dyed.
   d. Backing: Special non-thermoplastic Tri-Grip cleated SBR.
3. Color: As selected by Architect from manufacturer's full range.

2.2 CARPET – CPT-B

A. Basis of Design: Subject to compliance with requirements, provide Lees “High Marks” in color “Phenomenal 311,” by the Mohawk Group, or comparable product by the following.
1. Mannington.

B. Construction:
1. Yarn: Duracolor Premium Nylon with Antron Legacy.
   a. Solution dyed.
2. Face Weight: 20 oz. per square yard.
3. Backing: Unibond Flex.
4. Construction: Tufted.
5. Gauge: 1/12 inch minimum.
6. Average pile density: 6,154 oz. per square yard per ASTM D 418-82.

C. Size: 12 foot wide rolls.

2.3 CARPET – CPT-C

A. Basis of Design: Subject to compliance with requirements, provide Bigelow “In The Loop” in color “7652 Spring Leaf,” by the Mohawk Group, or comparable product by the following.
1. Mannington.

B. Construction:
1. Yarn: Colorstrand SD Nylon.
   a. Solution dyed.
2. Face Weight: 20 oz. per square yard.
3. Backing: Weldlok.
4. Construction: Tufted.
5. Gauge: 1/8 inch minimum.
6. Average pile density: 6,545 oz. per square yard per ASTM D 418-82.

C. Size: 12 foot wide rolls.

2.4 CARPET – CPT-D

A. Basis of Design: Subject to compliance with requirements, provide Lees “By The Book” in color “311 Phenomenal,” by the Mohawk Group, or comparable product by the following.
1. Mannington.

A. Construction:
1. Yarn: Duracolor Premium Nylon with Antron Legacy.
   a. Solution dyed.
2. Face Weight: 18 oz. per square yard.
3. Backing: Unibond Flex.
4. Construction: Textured Multi Colored Loop.

5. Gauge: 1/12 inch minimum.
6. Average pile density: 5,492 oz. per square yard per ASTM D 418-82.

B. Size: 12 foot wide rolls.

2.5 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended by carpet tile manufacturer for releasable installation.
1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
3. CRI “Green Label approved.

C. Tackless Carpet Stripping: Water-resistant plywood, in strips as required to comply with CRI 104, Section 12.2.

D. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

E. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

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. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
2. Subfloor finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" for slabs receiving carpet tile.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

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

3.2 PREPARATION

A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet or carpet tile installation.

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 (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.

C. Leveling of major uneven concrete floor joints or other irregularities by bush hammering or grinding and filling will be accomplished by General Contractor. Leveled areas shall be inspected by the Architect before carpeting work may proceed. Minor filling of low areas, irregularities and filling of control joints will be performed by this Contractor. **NO EXTRAS ALLOWED FOR ANY AMOUNT OF PREPARATION.**

D. 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 carpet tile manufacturer.

E. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

F. Sand or grind surface smooth to eliminate telegraphing and photographing of depressions, peaks, roughness, high points, and surface characteristics of underlayment.

G. Broom and vacuum clean substrates to be covered immediately before installing carpet or carpet tile.

3.3 INSTALLATION

A. General: Comply with CRI 104 and with manufacturer's written installation instructions.

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

C. Do not bridge building expansion joints with carpet.

D. Installation Method: As recommended in writing by carpet tile manufacturer.

E. Maintain dye lot integrity. Do not mix dye lots in same area.

F. 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 manufacturer.

G. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

H. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

I. Install pattern parallel to walls and borders.

J. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive, seam sealer, 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 CRI 104, Section 16, "Protecting Indoor Installations."

C. Protect carpet and 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 manufacturer.

END OF SECTION 09 68 13

SECTION 09 72 93

DIGITALLY-PRINTED VINYL WALL COVERING

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. Digitally-printed vinyl wall covering.

B. Related Sections:
   1. Section 01 23 00 “Alternates.”
   2. Section 09 29 00 “Gypsum Board Assemblies.”
   3. Section 09 91 13 "Interior Painting.”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.

B. Shop Drawings: Show location and extent of each wall-covering graphical image. Indicate seams and termination points.

C. Samples for Initial Selection: Small scale mockup for each graphical image of wall covering indicated, including all graphics and colors.
   1. Size: not less than 11 inches x 17 inches.
   2. Provide samples for individual colors, if requested.

D. Samples for Verification: Provide one full width by full height section of wall covering for each graphical image.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for wall covering.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.6 PROJECT 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 temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
   1. Condition spaces for not less than 48 hours before installation.

B. Lighting: Do not install wall covering until a permanent level of lighting 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. Low-Emitting Materials: Wall covering system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Mildew-resistant products.

C. Fire Rating: Class A.

2.2 DIGITALLY-PRINTED VINYL WALL COVERING

A. Basis of Design Product: Subject to compliance with requirements, provide DreamScape Suede, by MDC, www.mdcwall.com, or comparable product by one of the following:
   1. Color X, www.color-x.com.
   2. KoroGraphics, www.korographics.com.
   3. Wolf Gordon, www.wolfgordon.com.

B. Wall Covering: FS CCC-W-408D, and CFFA-W-101-D, Type II, Class A.
   1. Total Weight: 20 oz.
   2. Backing: Polyester-cotton blend.

C. Finish: Digitally-printed graphic image based on art provided by Architect.

2.3 ACCESSORIES

A. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific wall covering and substrate application; as recommended in writing by wall-covering manufacturer.

B. Primer/Sealer: Mildew resistant, complying with requirements in Section 09 91 3 "Painting" and recommended in writing by wall-covering manufacturer for intended substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, 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, mildew, and incompatible primers.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
   1. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.

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 48 hours before installation.

3.3 INSTALLATION

A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated except where more stringent requirements apply.

B. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.

C. Match pattern across applied strips for a single continuous graphic image.

D. Install seams vertical and plumb at least 6 inches (150 mm) from outside corners and 3 inches (75 mm) from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.

E. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

F. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.
   1. Match pattern across applied strips for a single continuous graphic image.

3.4 CLEANING

A. Remove excess adhesive at finished 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 93

SECTION 09 81 29

SPRAYED ACOUSTIC INSULATION

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 sprayed cellulose acoustic insulation.

1.3 DEFINITIONS

A. NRC: Noise reduction coefficient.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.

C. Shop Drawings: Framing plans, schedules, or both, indicating the following:
   1. Extent of application for each thickness and rating.
   2. Treatment required for each structural component and assembly.

D. 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. Manufacturer’s Certification.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For inclusion in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual licensed by manufacturer for application of sprayed acoustical insulation.

B. Mockups: Apply 100 square feet in location directed by Architect.
   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.

C. Manufacturer’s Certification: Provide written certification that products contain no asbestos or urea-formaldehyde.

D. Recycled Content: Minimum fiber recycled content not less than 75%.

1.8 DELIVERY, STORAGE AND HANDLING

A. Comply with sprayed acoustic insulation manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

B. Deliver in original, unopened containers bearing name of manufacturer and product identification.

C. Store materials dry, off the ground, and under cover.

D. Protect liquid adhesives from freezing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer’s recommendations. Do not apply sprayed acoustic insulation when ambient or substrate temperature is 44 deg F (7 deg C) 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 sprayed acoustic insulation, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations: Obtain sprayed acoustic insulation and accessory materials from single source.

B. Sprayed material shall meet all standards of performance of ASTM C1149.

C. Acoustical Performance: Minimum sound absorption NRC of 1.00.

D. Thickness: 1 ½ inches.

E. Color: White.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide K-13, manufactured by International Cellulose Corporation. No substitutions.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that are compatible with sprayed acoustic insulation and substrates and are approved by manufacturer.

B. Substrate Primers: Primers approved by sprayed acoustic insulation manufacturer.

C. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing 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. Verify compliance with the following:

1. 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 fireproofing with substrates under conditions of normal use or fire exposure.
2. Objects penetrating sprayed acoustic insulation, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
3. Substrates receiving sprayed acoustic insulation are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with application.

B. Verify that concrete work on steel deck has been completed before beginning work.

C. 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 sprayed acoustic insulation materials during application.

B. Clean substrates of substances that could impair bond of sprayed acoustic insulation.

C. Prime substrates where recommended in writing by sprayed acoustic insulation manufacturer.

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 fireproofing. Remove minor projections and fill voids that would telegraph through sprayed acoustic insulation products after application.

3.3 APPLICATION

A. Comply with sprayed acoustic insulation manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply sprayed acoustic insulation.

B. Coordinate application of sprayed acoustic insulation with other construction to minimize need to cut or remove sprayed acoustic insulation.
   1. Do not begin applying sprayed acoustic insulation until clips, hangers, supports, sleeves, and other items penetrating sprayed acoustic insulation are in place.
   2. Defer installing ducts, piping, and other items that would interfere with applying sprayed acoustic insulation until application of sprayed acoustic insulation is completed.

C. Install auxiliary materials as required, as detailed, and according to manufacturer's written recommendations for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by sprayed acoustic insulation manufacturer.

D. Spray apply sprayed acoustic insulation. Extend sprayed acoustic insulation in full thickness over entire area of each substrate.

E. Install body of sprayed acoustic insulation in a single course unless otherwise recommended in writing by sprayed acoustic insulation manufacturer.

F. Provide a uniform finish complying with description indicated for each type of sprayed acoustic insulation material and matching finish approved for mockups.

G. Cure sprayed acoustic insulation according to manufacturer's written recommendations.

H. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and corrections have been made to deficient applications.

3.4 FIELD QUALITY CONTROL

A. Field Testing: Owner will engage the services of a qualified testing agency to inspect and test sprayed acoustic insulation for applied thickness.
   1. Contractor shall touch up and restore applied insulation surfaces damaged by testing.
   2. If test results show that applied thickness of sprayed acoustic insulation does not comply with indicated requirements and manufacturer's written recommendations, Contractor shall pay for testing and re-apply sprayed acoustic insulation as needed to comply with requirements.

3.5 CLEANING, PROTECTING, AND REPAIRING

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.

B. Protect sprayed acoustic insulation, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes.

C. As installation of other construction proceeds, inspect sprayed acoustic insulation and repair damaged areas and sprayed acoustic insulation removed due to work of other trades.

D. Repair sprayed acoustic insulation by reapplying it using same method as original installation.

END OF SECTION 09 81 29

SECTION 09 84 00

ACOUSTIC COMPONENTS

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 shop-fabricated panel units tested for acoustical performance, including:
1. Ceiling Diffuser Panels for installation in an Acoustical Panel Ceiling grid.
2. Tuned Absorber/Diffuser panels ("TAD" panels), for ceiling mount.
3. Fabric-wrapped acoustic wall panels.
4. Closed-cell isolation material.
5. Outlet box backer pads.
~~3.~~6. Wood diffuser panels.

B. Related Requirements:
1. Section 06 20 23 "Finish Carpentry."
2. Section 09 51 13 "Acoustical Panel Ceilings."
~~1.~~3. Section 09 91 13 "Painting."

1.3 DEFINITIONS

A. NRC: Noise Reduction Coefficient.

B. SAA: Sound Absorption Average.

1.4 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of panel facing, fabric, panel edge, core material, and mounting indicated.

C. Shop Drawings: Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge and core materials.
1. Include elevations showing panel sizes and direction of fabric weave and pattern matching.

D. Samples for Initial Selection: For each type of fabric facing from sound-absorbing wall unit manufacturer's full range.

E. Samples for Verification: For the following products, prepared on Samples of size indicated below:
1. Ceiling Diffuser Panel: 6 inch by 6 inch sample that includes panel edge.
2. Fabric: Full-width by approximately 36-inch- (900-mm-) long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
3. Panel Edge: 12-inch- (300-mm-) long Sample(s) showing each edge profile, corner, and finish.
4. Core Material: 12-inch- (300-mm-) square Sample at corner.
5. Mounting Devices: Full-size Samples.
6. Assembled Panels: Approximately 36 by 36 inches (900 by 900 mm), including joints and mounting methods.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, 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. Light fixtures, HVAC diffusers and sprinklers.
2. Electrical outlets, switches, and thermostats.
3. Items penetrating or covered by sound-absorbing wall units including the following:
    a. Lighting fixtures.
    b. Air outlets and inlets.
    c. Speakers.
    d. Alarms.
    e. Sprinklers.
    f. Access panels.
4. Show operation of hinged and sliding components covered by or adjacent to sound-absorbing wall units.

B. Product Certificates: For each type of sound-absorbing wall unit, from manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: To include in maintenance manuals. Include manufacturers' written cleaning and stain-removal recommendations.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than 10 yards (9 m).
2. Tuned Absorber/Diffuser panels and Acoustical Wall Panel Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than four devices.

1.8 QUALITY ASSURANCE

A. Source Limitations: Obtain Tuned Absorber/Diffuser panels and Acoustic Wall panels from single source from single manufacturer.

B. Fire-Test-Response Characteristics: Provide acoustic components meeting the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
    a. Flame-Spread Index: 25 or less.
    b. Smoke-Developed Index: 450 or less.
2. Fire Growth Contribution: Meeting acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 286.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with 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.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install sound-absorbing wall 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 sound-absorbing wall units until permanent lighting is provided in the rooms and spaces to receive the units.

C. Air-Quality Limitations: Protect sound-absorbing wall 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 locations of sound-absorbing wall units and actual dimensions of openings and penetrations by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSER PANELS

A. Thermo-molded co-polymer shaped acoustical panels that will install (lay-in) into acoustical panel ceiling grids.
   1. Pyramidal Tiles: 2 feet x 4 feet, white, 0.125 inch thick, offset pyramidal diffuser, with fiberglass batt insulation bonded to rear surface.
      a. Application: Where indicated.

B. Basis of Design: Subject to compliance with requirements, provide Kinetics Noise Control Geometric Diffusers, or comparable products by one of the following:
   1. G & S Acoustics, www.gsacoustics.com.
   2. RPG Diffuser Systems, www.rpginc.com.

2.2 TUNED ABSORBER/DIFFUSER PANELS ("TAD" PANELS)

A. Fabric-wrapped fiberglass absorber/diffuser panel with custom hole pattern in fiberglass facing layer.

B. Basis of Design: Subject to compliance with requirements, provide Tuned Absorber/Diffuser Panel by Kinetics Noise Control, or comparable products by one of the following:
   1. Acoustical Panel Systems (APS, Inc.).
   2. Benton Brothers Solutions, Inc.
   3. Conwed Designscape; an Owens Corning company.
   4. Decoustics Limited; a CertainTeed Ceilings company.
   5. Essi Acoustical Products.
   6. Golterman & Sabo.
   7. Lamvin, Inc.
   8. Panel Solutions, Inc.
   9. Perdue Acoustics.
   10. Pinta Acoustic, Inc.
   11. Proudfoot Company, Inc. (The).
   12. Sound Management Group LLC.
   13. Wall Technology, Inc.; an Owens Corning company.
   14. Working Walls, Inc.

C. General Requirements: Units shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Tuned Absorber/Diffuser Ceiling Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
   1. Mounting: Back mounted with manufacturer's standard impaling clips with adhesive.
   2. Core: 6-7 PCF fiberglass core.
      a. Laminate facing, 1/8 inch thick, with custom perforation pattern.
   3. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
   4. Edge Profile: Square.
   5. Corner Detail in Elevation: Square with continuous edge profile indicated.
   6. Facing Material: Fabric selected by Architect from manufacturer's full range.
   7. Acoustical Performance: Sound absorption NRC not less than 1.19.
   8. Nominal Panel Thickness: 2 1/8 inches.
   9. Panel Size: As indicated on Drawings.

2.3 SOUND-ABSORBING WALL/CEILING UNITS

A. Basis of Design: Subject to compliance with requirements, provide Hardside, and High Impact Hardside by Kinetics Noise Control, or comparable products by one of the following:
   1. Acoustical Panel Systems (APS, Inc.).
   2. Benton Brothers Solutions, Inc.
   3. Conwed Designscape; an Owens Corning company.
   4. Decoustics Limited; a CertainTeed Ceilings company.
   5. Essi Acoustical Products.

6. Golterman & Sabo.
7. Lamvin, Inc.
8. Panel Solutions, Inc.
9. Perdue Acoustics.
10. Pinta Acoustic, Inc.
11. Proudfoot Company, Inc. (The).
12. Sound Management Group LLC.
13. Wall Technology, Inc.; an Owens Corning company.
14. Working Walls, Inc.

B. General Requirements: Units shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. HardSide Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
1. Mounting: Back mounted with manufacturer's standard impaling clips with adhesive.
2. Core: 6-7 PCF fiberglass core.
3. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
4. Edge Profile: Square.
5. Corner Detail in Elevation: Square with continuous edge profile indicated.
6. Facing Material: ~~Fabric~~ Anchorage 2335 by Guilford of Maine. Color selected by Architect from manufacturer's full range.
7. Acoustical Performance: Sound absorption NRC not less than 1.00.
8. Nominal Panel Thickness: 2 inches (51 mm).
9. Panel Size: As indicated on Drawings.

D. High Impact HardSide Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
1. Mounting: Back mounted with manufacturer's standard impaling clips with adhesive.
2. Core: 6-7 PCF fiberglass core.
   a. High-impact high-density fiberglass facing, 1/8 inch thick.
3. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
4. Edge Profile: Square.
5. Corner Detail in Elevation: Square with continuous edge profile indicated.
6. Facing Material: Fabric selected by Architect from manufacturer's full range.
7. Acoustical Performance: Sound absorption NRC not less than 1.05.
8. Nominal Panel Thickness: 2 1/8 inches.
9. Panel Size: As indicated on Drawings.

2.4 FABRICATION FOR TAD (CEILING) AND WALL PANELS

A. General: Use manufacturer's standard construction except as otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.
1. Glass-Fiber Board and Mineral-Fiber Board Cores: Chemically harden core edges and areas of core where mounting devices are attached.

B. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.

C. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
1. Square Corners: Tailor corners.
2. Radius and Other Nonsquare Corners: Attach facing material so there are no seams or gathering of material.
3. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.

D. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch (1.6 mm) for the following:

1. Thickness.
2. Edge straightness.
3. Overall length and width.
4. Squareness from corner to corner.
5. Chords, radii, and diameters.

2.5 CLOSED CELL ISOLATION MATERIAL

A. Provide AP/Armaflex Tubes and AP/Armaflex Sheet and Roll, manufactured by armacell.
1. Flexible elastomeric closed-cell insulation.
2. Thickness: As indicated or as required.

2.6 OUTLET BOX BACKER PAD

A. Provide Seal Tight Outlet Box Backer Pads, manufactured by Kinetics Noise Control.
1. Heavy mastic putty, 1/8 inch thick.

2.7 WOOD DIFFUSER PANELS

A. Provide HighTones Wood Diffuser Panels by Kinetics Noise Control.
1. Hardwood species: maple.
~~5.~~2. Finish: Shop-finished, transparent. Comply with requirements of Section 09 91 13 "Painting" for Interior Wood (Transparent Finish).

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 performance of sound-absorbing wall units.

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

3.2 INSTALLATION

A. Install units in locations indicated 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 indicated. Mount units securely to supporting substrate.
~~B.~~1. For ceiling-mounted units mounted on z-clips, provide adhesive at the ceiling/panel clip connection to prevent movement of the panel.

C. Align and level fabric pattern and grain among adjacent units.

D. Install wood diffuser panels in compliance with manufacturer's written instructions and requirements of Section 06 20 23 "Finish Carpentry."

~~C.~~E. Outlet Box Backer Pads: Hand-form around outlet boxes, per manufacturer written instructions.

3.3 INSTALLATION TOLERANCES

A. Variation from Plumb and Level: Plus or minus 1/16 inch (1.6 mm).

B. Variation of Panel Joints from Hairline: Not more than 1/32 inch (0.79 mm) wide.

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 00

SECTION 09 91 13

PAINTING

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 surface preparation and the application of paint systems on exterior and interior substrates.
   1. Finish all interior and exterior surfaces exposed to view, unless fully factory finished or indicated in this Section not to be finished. Schedule of Exterior and Interior Surface Painting Systems to be provided is located at the end of Part 3 Execution.

B. Related Requirements:
   1. Section 05 12 00 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this Section.
   2. Section 09 72 00 “Wall Coverings” for priming of surfaces to receive wallcovering.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 REFERENCES

A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Master Painters and Decorators Association; latest edition.

1.5 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product. Include preparation requirements and application instructions.

C. Laboratory Test Reports: For paints and coatings, documentation indicating that they meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

D. Samples for Initial Selection: For each type of topcoat product.

E. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
   1. Submit Samples on rigid backing, 8 inches (200 mm) square.
   2. Step coats on Samples to show each coat required for system.
   3. Label each coat of each Sample.
   4. Label each Sample for location and application area.
   5. Samples: Submit two paper "drop" samples, 8-1/2 by 11 inches in size, illustrating range of colors, stains and textures available for each finishing product specified. Refer to Sections 062000 for wood species to submit. Remake samples until acceptable to Architect.

F. Product List: For each product indicated, include the following:
   1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

G. Allow 30 days for approval process, after receipt of complete samples by Architect. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

H. Color Schedule: Architect will provide color documentation to the Contractor listing paint colors selected. If materials of other manufacturers are accepted by Architect, colors must match those of paint colors selected.

I. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

J. Accent colors or deep tone colors (contrasting bright colors) shall be applied where indicated on forthcoming Color Documentation. Where bright colors are selected, apply extra coats of paint where required to obtain a completely opaque surface. Additional labor or materials to achieve this level of finish will not be accepted as "extra cost".

K. At Final Completion, submit list, by room number, of paint color and manufacturer for inclusion in Operations and 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. Paint: ~~5 percent~~All unopened and un-used paint buckets and cans that remain at the end of the project, but not less than ~~2 gal. (7.6 L) of each material and color applied~~one 5-gal. bucket of each primary color and one gallon of each accent color in unopened containers..

1.7 QUALITY ASSURANCE

A. Face Brick – Emulsion Color Treatment (Masonry Stain) Installer Qualifications: Minimum of three years demonstrated experience installing products of a similar type and scope.

B. 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 specified in Part 3.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
      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.
   5. Paint mason's block sample wall at time of its construction to establish acceptance quality of filling and finish coats.
   6. Provide door and frame assembly illustrating coating color, texture, and finish.

C. Workmanship shall be first class throughout or work will be subject to rejection and refinishing at no additional cost to Owner.

1.8 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 (7 deg C).
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.9 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

C. If woodwork, metal or any other surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding and puttying operations, notify General Contractor and Architect in writing or assume responsibility for any unsatisfactory resulting finish.

D. Do not apply paint, stains or finishes in areas where dust is being generated or where rubbish has accumulated or is being removed.

E. All painting of exterior and interior items requiring alkyd enamel and epoxy to be painted when building is unoccupied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following.
   1. Diamond Vogel (D-V).
   2. Kwal.
   3. Sherwin Williams (S-W).

B. Subject to compliance with requirements, provide products listed in Part 3 Painting Schedules for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:
   1. Provide materials for use within each paint system 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.
   2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2- dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, asbestos, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

D. Colors: Custom colors to match Architect’s sample.
   1. 10 percent of surface area will be painted with deep tones (accent colors).

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
   1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with

rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

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 CMU): 12 percent.
   3. Wood: 15 percent.
   4. Portland Cement Plaster: 12 percent.
   5. Gypsum Board: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

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 in "MPI Manual" 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.

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. Prepare previously-painted surfaces according to recommendations in “MPI Manual” and written instructions of the topcoat manufacturer.

E. 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.

F. 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.

G. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

H. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

I. 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.

J. Aluminum Substrates: Remove loose surface oxidation.

K. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
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.

L. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

M. Surfaces to receive wallcovering will be primed by wallcovering subcontractor. See Section 009 72 00 Wall Coverings for details.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
    a. Primer applied in preparation for applying texture finish to gypsum board (specified in Section 09 29 00 Gypsum Board Assemblies) is not a substitute for primer applied in preparation for applying a paint finish coat. Primer may not be omitted when painting textured gypsum board assemblies.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. 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 all mechanical and electrical equipment, except that which is factory finished or aluminum, exposed to weather or to view on the roof and outdoors and including the following work, where exposed to view:
    a. Equipment, including panelboards and switch gear.
    b. Uninsulated metal piping.
    c. Uninsulated plastic piping.
    d. Pipe hangers and supports.
    e. Metal conduit (to match adjacent wall).
    f. Plastic conduit (to match adjacent wall).
    g. Tanks that do not have factory-applied final finishes.
2. Remove louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately. These items shall be spray painted in colors as directed by Architect (generally to match adjacent finished materials), and returned for installation. Touch up screws and scuffed spots, or repaint to achieve uniform finish.
3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets with flat, nonspecular black paint where visible through registers, grilles, or louvers.

4. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

F. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

G. **Do Not Paint** or Finish the Following Items:
1. Items fully factory-finished unless specifically noted; factory-primed items are not considered factory-finished.
2. Items indicated to receive other finish.
3. Items indicated to remain naturally finished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Anodized aluminum.
6. Polished and brushed stainless steel items.
7. Brick, precast concrete, integrally colored plaster.
8. Concrete masonry in utility, mechanical, and electrical spaces unless noted to be painted.
9. Polished and brushed stainless steel, anodized aluminum, bronze, terne, and lead.
10. Acoustical materials.
11. Concealed piping, ductwork, and conduit.

H. Ensure complete coverage of block filler such that pores and pinholes are filled. At Toilet Rooms and Food Preparation areas apply filler coats until completely smooth and acceptable to Health Department having jurisdiction.

I. Paint entire wall where patching is to be painted and nearest horizontal break line, or ceiling, if none is existing.

J. Face Brick – Emulsion Color Treatment (Masonry Stain): Verify color uniformity 12 hours after application. Recoat areas where blotches, blemishes or imperfections are present.

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.

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 EXTERIOR PAINTING SCHEDULE

A. Ferrous Metals, including areas on roof not visible from ground. First coat not required on items with prime coat applied by manufacturer. Two finish coats over primer.
1. Primer: Synthetic rust-inhibiting primer, total dry film thickness of not less than 1.4 mils.
a. D-V: Vers-Acryl 200 Acrylic Maintenance Primer/Finish.
b. Kwal: 5820 Rust Inhibitive DTM Primer.
c. S-W: Pro-Cryl (B66-310).
2. First and Second Coats: Acrylic gloss alkyd enamel, total dry film thickness of not less than 3.7 mils.

a. D-V: Nu-Cling Gloss Acrylic Enamel, MH Series.
b. Kwal: 8300 Acrylic Gloss DTM Enamel.
c. S-W: DTM (B66-100).

B. Zinc Coated Metals (Galvanized) including areas on roof not visible from ground. Gloss Enamel: Two finish coats over primer.
1. Treatment as described in Part 3, Preparation, for galvanized metal.
2. Primer: Galvanized metal primer, total dry film thickness not less than 2.5 mils.
a. D-V: Vers-Acryl 200 Acrylic Maintenance Primer/Finish.
b. Kwal: 5810 G-Prime Universal Primer.
c. S-W: Pro-Cryl (B66-310).
3. First and Second Coats: Acrylic gloss enamel, total dry film thickness not less than 2.6 mils.
a. D-V: Nu-Cling Gloss Acrylic Enamel, MH Series.
b. Kwal: 8300 Acrylic Gloss DTM Enamel.
c. S-W: DTM (B66-100).

C. Exterior Structural Steel (Not Galvanized):
1. Shop Primed by 05 12 00 Contractor, not less than 3.0 mils:
a. D-V: Mult-E-Poxy 180.
b. Kwal/Coronado: 180-11 DTM Primer.
c. S-W: Macropoxy 646 (B58-600). (Pro-Cryl (B66-310).
2. SSPC SP1 clean and lightly sand to achieve adhesion.
3. Final Coat, not less than 2.0 mils:
a. D-V: Vers-Acryl 222 Acrylic Semi-Gloss.
b. Kwal/Coronado: DTM 182, Semi -Gloss, (DTM 180, Gloss).
c. S-W: DTM Acrylic (B-66).

3.7 INTERIOR PAINTING SCHEDULE

A. Concrete Block - Semi Gloss Latex Enamel Finish: Two finish coats over an undercoat and a filled surface.
1. Block Filler: High performance latex-based block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness not less than 5.0 mils. Apply in two coats to permit identification and correction of CMU surface irregularities, pinholes not filled and the like after the first coat.
a. D-V: Dia-Pro Acrylic Block Filler, BF-1515
b. Kwal: C302 Ultratech Block Filler.
c. S-W: Heavy Duty Block Filler B42W46.
2. First and Second Coats: Interior, satin latex enamel, total dry film thickness of not less than 2.8 mils.
a. D-V: Vantage Plus Semi-Gloss Enamel, DS Series.
b. Kwal: 3000 Accupro Semi-Gloss. (C136 Ultratech).
c. S-W: ProMar 200 Semi-Gloss. (S-W ProMar 200 Zero VOC Semi-Gloss B31-2600).
~~3. All walls above 7 feet 2 inches high "rail":~~
~~a. Block Filler: High performance latex-based block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness not less than 5.0 mils. Apply in two coats to permit identification and correction of CMU surface irregularities, pinholes not filled and the like after the first coat.~~
~~1) D-V: Dia-Pro Acrylic Block Filler, BF-1515.~~
~~2) Kwal: C302 Ultratech Block Filler.~~
~~3) S-W: Heavy-Duty Block Filler B42W46.~~
~~b. First and Second Coats: Interior flat latex enamel, Pure Brilliant White, 92% "Y" Directional Reflectance measured with an X-Rite SP64 handheld Spectrophotometer, total dry film thickness not less than 3.2 mils.~~
~~1) D-V: Vantage Plus Flat Enamel, DF Series.~~
~~2) Kwal: 0900 Accu-Pro Flat. (C132 Ultratech Flat).~~
~~3) S-W: ProMar 200 Flat Acrylic. (ProMar 200 Zero VOC Flat B30-2600).~~

B. Concrete Block - Epoxy Emulsion Coating: Where indicated on Finish Schedule and/or on Drawings, provide one coat block filler and two finish coats epoxy emulsion.
   1. Block Filler: Total dry film thickness not less than 5.0 mils.
      ~~a. D-V: Dia-Pro Acrylic Block Filler, BF-1515.~~
      ~~b. Kwal: C302 Ultratech Block Filler.~~
      ~~c. S-W: Heavy Duty Block Filler B42W46.~~
   ~~2. First and Second Coats: Epoxy Emulsion, semi-gloss finish.~~
      ~~a. D-V: Vers-E-Poxy 131 Waterborne Acrylic Epoxy.~~
      ~~b. Kwal: 3190 Waterborne Semi-Gloss Epoxy.~~
      ~~c. S-W: Fast Clad DTM Epoxy B-70 Series. (Pro Industrial Zero VOC Waterborne Catalyzed Epoxy B73-300).~~

C. Face Brick - Emulsion Color Treatment (Masonry Stain): Where indicated on Finish Schedule and/or on Drawings, provide finish coats necessary to match Architect's sample.
   1. Finish Coats:
      a. Nawkaw: NECT-90 - Hydrous.

D. Gypsum Board:
   1. Primer: White, interior, latex-based primer, total dry film thickness not less than 1.2 mils.
      a. D-V: Vantage Primer, DU-1511.
      b. Kwal: C152 Ultratech Primer.
      c. S-W: Pro-Mar 200 Latex Wall Primer B28W200. (ProMar 200 Zero VOC Primer).
   2. First and Second Coats: Interior satin latex enamel, total dry film thickness not less than 2.8 mils.
      a. D-V: Vantage Plus Eggshell Enamel, DE Series.
      b. Kwal: 2100 Accu-Tone Eggshell. (C106 Ultratech Eggshell).
      c. S-W: ProMar 200 Eggshell. (ProMar 200 Zero VOC Egshel B20-2600).
   3. All walls above 7 feet 2 inches high "rail":
      a. Primer: White, interior, latex-based primer, total dry film thickness not less than 1.2 mils.
         1) D-V: Vantage Primer, DU-1511.
         2) Kwal: C152 Ultratech Primer.
         3) S-W: Pro-Mar 200 Latex Wall Primer B28W200. (ProMar 200 Zero VOC Primer).
      b. First and Second Coats: Interior flat latex enamel, Pure Brilliant White, 92% "Y" Directional Reflectance measured with an X Rite SP64 handheld Spectrophotometer, total dry film thickness not less than 3.2 mils.
         1) D-V: Vantage Plus Flat Enamel, DF Series.
         2) Kwal: 2510 Accu-Pro Eggshell. (C132 Ultratech Eggshell).
         3) S-W: ProMar 200 Flat Acrylic. (ProMar 200 Zero VOC Egshel B20-2600).

E. Gypsum Board - Epoxy Emulsion Coating: Where indicated on Finish Schedule and /or on Drawings, provide one coat primer as recommended by coating manufacturer and two finish coats epoxy emulsion.
   1. Bond Coat: Primer White, Interior Latex Based Primer.
      a. D-V: Vantage Primer, DU-1511.
      b. Kwal: C309 Ultratech Primer.
      c. S-W: Pro-Mar 200 Latex Wall Primer B28W200.
   2. First and Second Coats: Epoxy Emulsion, semi-gloss finish.
      a. D-V: Vers-E-Poxy 131 Waterborne Acrylic Epoxy.
      b. Kwal: 3190 Waterborne Semi-Gloss Epoxy.
      c. S-W: Water Based Catalyzed Epoxy B70. (Pro Industrial Zero VOC Waterborne Catalyzed Epoxy B73-300 Series).

F. Ferrous Metal: Full Gloss Enamel Finish: Two coats over a primer.
   1. Primer: Synthetic, quick-drying, rust-inhibiting primer, total dry film thickness of not less than 1.5 mils.
      a. D-V: Vers-Acryl 200 Acrylic Maintenance Primer/Finish.
      b. Kwal: C309 Ultratech Primer.

c. S-W: Pro-Cryl (B66-310).

2. Finish Coat: Exterior, gloss, acrylic enamel, total dry film thickness of not less than 1.2 mils.
   a. D-V: Finium DTM-AT Acrylic Gloss Enamel.
   b. Kwal: 9800 Acrylic Gloss Enamel.
   c. S-W: Pro Industrial Gloss Acrylic B66-600 series.

G. Interior Wood (Transparent Finish), sand between each coat:
1. Oil Based Stain to achieve color:
   a. D-V: Old Masters Hi-Solid Penetrating Stain.
   b. Kwal: 8709 WoodKraft.
   c. S-W: A49-200 Wood Classics Stain. (Wood Classics 250 VOC Stain).
2. Sealer:
   a. D-V: Old Masters H20 Acrylic Satin Varnish.
   b. Kwal: 6840 Woodkraft Satin Acrylic Urethane.
   c. S-W: A68F90 Wood Classics Polyurethane, thinned. (Wood Classics Waterborne Polyurethane Varnish, A68 Series)
3. Two Finish Coats:
   a. D-V: Old Masters H20 Acrylic Satin Varnish.
   b. Kwal: 6840 WoodKraft Satin Acrylic Urethane.
   c. S-W: A68F90 Wood Classics Polyurethane.

H. Interior Wood Floor (Opaque Finish)
1. Primer: Low luster, acrylic latex, total dry film thickness of not less than 1.4 mils.
   a. D-V: Mill Max Enamel Undercoater, DU-1508.
   b. Kwal: C152 Ultratech Primer.
   c. S-W: B28W101 Prep Rite 200 Primer. (ProMar 200 Zero VOC Primer).
2. First and Second Coats: Low luster, acrylic latex enamel, total dry film thickness of not less than 2.8 mils.
   a. D-V: Vantage Plus Eggshell Enamel, DE Series.
   b. Kwal: 2100 Accu Pro PC Eggshell. (C106 Ultratech Eggshell).
   c. S-W: Classic 99. (ProMar 200 Zero VOC Eggshell B20-2600).

~~H.~~I. Exposed Metal Decking and Framing (Dry Fall):
1. First and Second Coats: Flat, alkyd enamel, total dry film thickness of not less than 2.8 mils.
   a. D-V: Luminance 300 Latex Dryfall.
   b. Kwal: C157 Ultratech Dryfall.
   c. S-W: Waterborne Acrylic Dryfall.
2. At Contractor's discretion, provide one coat of the following in lieu of the two coats described in paragraph above:
   a. Tnemec: Uni-Bond DF Series 115.

~~I.~~J. Surfaces to Receive Wallcovering:
1. Primer compatible with substrate and wallcovering, provided under Section 09 72 00 Wall Coverings.

K. Smoke and Acoustic Sealant:
1. One coat Hilti CP 572 Smoke and Acoustic Spray, with overspray to adjacent surfaces, dry film thickness as recommended by the manufacturer.

END OF SECTION 09 91 13

SECTION 10 11 00

VISUAL DISPLAY UNITS

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. Markerboards.
2. Glass Marker boards.
3. Marker Wall systems.
4. Tackboards.
5. Visual display rails.
6. Tack wall panels.
7. Support systems for visual display boards.
8. Grid wall display systems.
9. Interactive Projectors.

1.3 DEFINITIONS

A. Marker Wall: Markerboard surface generally designed for floor-to-ceiling and wall-to-wall installation.

B. Tackboard: Framed, tackable, visual display board assembly.

C. Tack Wall Panel: Tackable surfaces that are not fabricated into composite panel form but are applied directly to walls.

D. Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; includes, markerboards, and tackboards.

E. Visual Display Surface: A generic term that includes markerboards, tackboards, tack wall panels, and surfacing materials, prefabricated in a board assembly or directly mounted to walls.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
1. Show locations of panel joints.
2. Include sections of typical trim members.

C. Samples for Initial Selection: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:
1. Actual sections of porcelain-enamel face sheet, tackboard assembly, tack wall panel, display rail.
2. Include accessory Samples to verify color selected.

D. Samples for Verification: For each type of visual display surface indicated.
1. Visual Display Surface: Not less than 8-1/2 by 11 inches (215 by 280 mm), mounted on substrate indicated for final Work. Include one panel for each type, color, and texture required.
2. Trim: 6-inch- (152-mm-) long sections of each trim profile.
3. Display Rail: 6-inch- (152-mm-) long sections.
4. Rail Support System: 6-inch- (152-mm-) long sections.
5. Accessories: Full-size Sample of each type of accessory.

E. Product Schedule: For visual display surfaces. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Warranties: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 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: 50 or less.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-built visual display surfaces completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site.

B. Store visual display surfaces vertically with packing materials between each unit.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display surfaces 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.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.

1.10 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Surfaces lose original writing and erasing qualities.
      b. Surfaces exhibit crazing, cracking, or flaking.
   2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following. Except for glass marker boards, listed separately.
   1. Best-Rite Manufacturing.
   2. Claridge Products and Equipment, Inc.
   3. Ghent Manufacturing, Inc.

2.2 MARKERBOARD ASSEMBLIES

A. Basis of Design: Claridge, Series 4, magnetic surface.
   1. LCS-II markerboards
   2. Color: No. 75 Low Gloss White.

B. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 24 gauge steel porcelain-enamel face.
   1. MDF Core: 1/2 inch (13 mm) thick; with 0.005-inch- (0.127-mm-) thick, aluminum foil backing.
   2. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
   3. Surface shall accept magnetic aids.

4. Height: As indicated.
   a. No seams allowed.
5. Length: As indicated.
   a. Seams: Spline joint.
6. Frame: Extruded aluminum, Claridge #1015 ground with #1016 trim.
7. Music staff fused on surface on Music Rooms and as indicated.

2.3 GLASS MARKER BOARDS

A. Basis of Design: Glassboard Float, in Magnetic Pure White, by Clarus.
   1. Size: As indicated on the Drawings.
   2. Mounting: Double proprietary "Z" clip, with concealed fasteners, and for removable installation.
   3. Accessories: Marker tray "Box," with magnetic attachment.

B. Subject to compliance with requirements, comparable products by the following manufacturers will be considered.
   1. Bendheim.
   2. Corning.
   3. Egan Visual.
   ~~7.~~4.

~~2.3~~2.4 MARKER WALL SYSTEMS

A. Basis of Design: Claridge, Marker Wall, magnetic surface.
   1. Color: No. 75 Low Gloss White.

B. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 24 gauge steel porcelain-enamel face.
   1. Particleboard Core: 1/2 inch (13 mm) thick; with 0.005-inch- (0.127-mm-) thick, aluminum foil backing.
   2. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
   3. Surface shall accept magnetic aids.
   4. Height: 48 or 60 inches, as indicated.
   5. Length: As indicated.
      a. No seams allowed in the markerboard surface.
   6. Frame: Extruded aluminum.
   7. Accessories: Marker tray, map rail, flag holder, and map hooks.

~~2.4~~2.5 TACKBOARD ASSEMBLIES

A. Plastic-Impregnated-Cork Tackboard: 1/8-inch- (3-mm-) thick, plastic-impregnated cork sheet factory laminated to 1/2 inch thick fiberboard backing.
   1. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
   2. Height: 48 or 60 inches, as indicated.
   3. Length: As indicated.
   4. Frame: Extruded aluminum.

~~2.5~~2.6 VISUAL DISPLAY RAILS

A. Aluminum rail to hold paper sheets and thin boards.
   1. Length: As indicated.

B. Casso Display Rail, by AS Hanging Systems.

~~2.6~~2.7 TACK WALL PANELS

A. Tackable Wall Panels: Forbo "Bulletin Board" mounted directly to wall.
   1. 1/4 inch thick tackable surface with jute backing.
   2. Height: As indicated.
   3. Length: As indicated.
   4. Metal edge strip: Schluter – SCHIENE, in satin-finish anodized aluminum (no spacer).

B. Joint Accessories: Manufacturer's standard, at butt joints.

C. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific tack wall panels and substrate application, as recommended in writing by visual display surface manufacturer.

D. Primer/Sealer: Mildew-resistant primer/sealer complying with requirements in Section 09 91 13 "Painting" and recommended in writing by visual display surface manufacturer for intended substrate.

~~2.7~~2.8 RAIL SUPPORT SYSTEM FOR VISUAL DISPLAY BOARDS

A. Support Rails: Horizontal, wall-mounted, extruded-aluminum rails designed to receive hanger clip and to support visual display boards.
   1. Finish: Clear anodic.

B. Hanger Clips: Extruded aluminum with finish to match rails; designed to support independent visual display boards by engaging support rail and top trim of board.

~~2.8~~2.9 MARKERBOARD AND TACKBOARD ACCESSORIES

A. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- (1.57-mm-) thick, extruded aluminum; standard size and shape.
   1. Factory-Applied Trim: Manufacturer's standard, matching Claridge 180.
   2. Head: Manufacturer's standard, matching Claridge 181 with cork inset.

B. Marker Tray: Manufacturer's standard, continuous, matching Claridge 371A, with end closure.
   1. Radius corners ½ inch minimum.

C. Map Rail: When installed alone: Manufacturer standard, matching Claridge 51, with minimum 5/8 inch thickness cork insert.
   1. Map Hooks: Two map hooks for every 48 inches (1219 mm) of map rail or fraction thereof. Manufacturer standard matching Claridge 51M.
   2. End Stops: Located at each end of map rail. Manufacturer standard matching Claridge 51ES.
   3. Flag Holder: One for each classroom. Manufacturer standard matching Claridge 51FH.

~~2.9~~2.10 GRID WALL DISPLAY SYSTEM

A. Gridwall Panels – Slatwall Products, Spacewall International.

B. Steel wire, ¼ inch in diameter, 3 inches on center in opposing directions, formed into panels.
   1. Panel size: As indicated.
   2. Mounting: Wall bracket GR-WB.
   3. Hardware as required for a complete installation of grid panels.
      a. Accessories not included. Accessories will be provided by Owner.
   4. Color: As selected by Architect from manufacturer's full range of standard colors.

~~2.10~~2.11 FABRICATION

A. Visual Display Boards: Factory assemble visual display boards unless otherwise indicated.
   1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display boards at manufacturer's factory before shipment.
   2. No seams allowed in the markerboard surface.

B. Coordinate factory-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.
   1. Fabricate panels within manufacturer's maximum unit sizes, and as indicated. Internal joints in panels to accommodate fabrication size is not permitted.
   2. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.

C. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.
   1. Provide continuous perimeter trim: Head trim at top edge and marker tray at bottom edge.
   2. At Tackboards:
      a. Joints in trim shall occur only at mitered corners or center of bottom edge of board.

3. Trim shall be assembled and attached to visual display units at manufacturer's factory before shipment.

~~2.11~~2.12 GENERAL FINISH REQUIREMENTS

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.

~~2.12~~2.13 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

~~2.13~~2.14 INTERACTIVE PROJECTORS

A. Epson BrightLink 595Wi Interactive WXGA 3LCD Projector, including wall mount. No Substitutions.

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 surfaces.

C. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.

D. 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 the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.

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 surfaces and wall surfaces.

1. Prime wall surfaces indicated to receive direct-applied, tack wall panels and as recommended in writing by primer/sealer manufacturer and wall covering manufacturer.

D. Prepare recesses for sliding visual display units as required by type and size of unit.

3.3 INSTALLATION, GENERAL

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. Comply with local and national accessibility standards. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

1. Mounting Height for Kindergarten/ECE: 25 inches above finished floor to top of marker tray.
2. Mounting Height for Grades 1 and 2: 27 inches above finished floor to top of marker tray.
3. Mounting Height for Grades 3 through 5: 30 inches above finished floor to top of marker tray.
4. Mounting Height for Grades 6 through 12: 36 inches above finished floor to top of marker tray.

3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

A. Visual Display Boards: Attach visual display boards to wall surfaces with manufacturer standard rail and clips, spaced not more than 24 inches on center.
   1. Attach boards to wall surface by applying egg-size adhesive gobs in alternating (2-1-2) pattern at 24 inches (400 mm) o.c., for the full length of the board.
   2. Fasten with screws, into continuous, solid, fire treated wood blocking.

3.5 INSTALLATION OF VISUAL DISPLAY RAILS

A. Display Rails: Install rails in locations and at mounting heights indicated. Attach to wall surface with fasteners at not more than 16 inches (400 mm) o.c.
   1. Fasten with screws, into continuous, solid, fire treated wood blocking.

3.6 INSTALLATION OF TACK WALL PANELS

A. Tack Wall Panels: Attach wall sheets to wall surface with thin layer of adhesive over entire wall surface. Butt join adjacent panels, as indicated on the Drawings.
   1. Install metal edge strip at perimeter.

3.7 INSTALLATION OF MODULAR SUPPORT SYSTEM

A. Rail Support System: Install horizontal support rail in locations and at mounting heights indicated on Drawings, or if not indicated, at height indicated below. Attach to wall surface with fasteners at 12 inches (300 mm) o.c.
   1. Fasten brackets with screws, into continuous, solid, fire treated wood blocking.

3.8 INSTALLATIONOF DISPLAY CASES

A. General: Install units 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.
   1. Mounting Height: 72 inches (1829 mm) above finished floor to top of cabinet.

B. Surface-Mounted Display Cases: Attach units to wall surfaces with concealed clips, hangers, or grounds fastened at not more than 16 inches (400 mm) o.c. Secure both top and bottom of display cases to walls.

C. Install display case shelving level and straight.

D. Adjusting and Cleaning
   1. Adjust doors to operate smoothly without warp or bind and so contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
   2. Touch up factory-applied finishes to restore damaged or soiled areas.

3.9 CLEANING AND PROTECTION

A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 10 11 00

SECTION 10 14 19

DIMENSIONAL LETTER SIGNAGE

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. Cast dimensional characters.
   2. Cutout dimensional characters.
   3. Backlighted illuminated characters.
   4. Bronze plaques.

B. Related Requirements:
   1. Division 26 – Electrical.

1.3 DEFINITIONS

A. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

1.4 COORDINATION

A. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 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 sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   3. Show message list, typestyles, graphic elements, and layout for each sign at least 3” = 1’-0” scale.
   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 finishes, in manufacturer's standard size unless otherwise indicated and as follows:
   1. Dimensional Characters: Full-size Sample of each type of dimensional character.
   2. Exposed Accessories: Full-size Sample of each accessory type.

E. Sign Schedule: Use same designations indicated on Drawings.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs 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 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.

1.10 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. Thermal Movements: For exterior signage, allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. 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. Subject to compliance with requirements, provide products by one of the following:
   1. A. R. K. Ramos Signage Systems.
   2. ASI Sign Systems, Inc.
   3. Gemini Incorporated.
   4. Matthews International Corporation; Bronze Division.
   5. Metal Arts; Division of L & H Mfg. Co.
   6. Metallic Arts.
   7. Southwell Company (The).

2.3 CAST DIMENSIONAL CHARACTERS

A. Cast Characters: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:
   1. Character Material: Cast aluminum.
   2. Character Height: 16 inches, and as indicated.
   3. Thickness: Manufacturer's standard for size of character.
   4. Finishes:
      a. Integral Aluminum Finish: Clear anodized.
         1) ASTM B 26/B 26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.
   5. Mounting: Concealed studs.
   6. Typeface: Times Roman.

2.4 CUTOUT DIMENSIONAL CHARACTERS

A. Cut Characters: Characters with uniform faces; square-cut, smooth edges; precisely formed lines and profiles.
   1. Character Material: Sheet or plate aluminum.
   2. Character Height: 18 inches, and as indicated.
   3. Thickness: 0.125 inch (3.18 mm).
   4. Integral Aluminum Finish: Brushed aluminum.
   5. Mounting: Concealed studs.
   6. Typeface: As selected by Architect from manufacturer’s full range of standard typefaces.

2.5 BACKLIGHTED ILLUMINATED CHARACTERS

A. Fabricated Channel Characters: 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 and for securing fasteners; and as follows.
   1. Illuminated Characters: Backlighted character construction 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.
   2. Character Material: Sheet or plate aluminum.
   3. Material Thickness: Manufacturer's standard for size and design of character.
   4. Character Height: As indicated.
   5. Character Depth: Two inches, or as indicated.
   6. Finishes:
      a. Integral Aluminum Finish: Anodized color as selected by Architect from full range of industry colors and color densities.
   7. Mounting: Projecting studs.
      a. Hold characters at 2-inch (51-mm) from wall surface.
   8. Typeface: As selected by Architect from manufacturer’s full range of standard typefaces.

2.6 CAST PLAQUES

A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

B. Plaque: Plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   1. Plaque Material: Cast bronze, ASTM B 584.
   2. Size: 18 inches by 18 inches, and as indicated.
   3. Plaque Thickness: 0.50 inch (12.7 mm).
   4. Finishes:
      a. Integral Metal Finish: Mill finish raised surface with dark oxidized background.
   5. Background Texture: Pebble.
   6. Integrally Cast Border Style: As indicated.
   7. Mounting: Rosette-head through fasteners.
   8. Text and Typeface: Text provided by Architect. Typeface as selected by Architect from manufacturer's full range and variable according to content.

2.7 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. For exterior exposure, furnish stainless-steel devices unless otherwise indicated.
   3. Sign Mounting Fasteners:
      a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.
      b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.
      c. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.8 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 signs for stability and for securing fasteners.
6. Provide rebates, lugs, and brackets 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.

2.9 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.

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 signage work.

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

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. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners 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 23

PANEL SIGNAGE

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. Panel signs for:
      a. Directional signage.
      b. Room identification.
      c. Restroom signage.
      d. Regulatory signage.

B. Related Requirements:
   1. Section 01 50 00 "Temporary Facilities and Controls" for temporary Project identification signs and for temporary information and directional signs.
   2. Section 14 21 00 "Electric Traction Elevators" or code-required conveying equipment signage.

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.

C. Shop Drawings: For panel 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 others, and accessories.
   3. Provide location for each sign on floor plans.
   4. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

D. 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.

E. Samples for Verification: For each type of sign assembly showing all components and with the required finishes, in manufacturer's standard size unless otherwise indicated and as follows:
   1. Panel Signs: Full-size Sample.
   2. Exposed Accessories: Full-size Sample of each accessory type.

F. Sign Schedule: Use same designations specified or indicated on Drawings or in sign schedule.

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 installed signage by field measurements before fabrication, and indicate conditions on Shop Drawings.

PART 2 - PRODUCTS

2.1 PANEL SIGNS, GENERAL

A. Regional Materials: Panel signs shall be manufactured within 500 miles (800 km) of Project site.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

2.3 SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Arapahoe Signs, Inc.
2. ASI Sign Systems, Inc.
3. Avalis Wayfinding Solutions, Inc.
4. Best Sign Systems Inc.
5. Fast Signs DTC.
6. Avalis LetterLock chemically welded production process is an acceptable substitution for the specified photopolymer production process.

B. Panel Signs: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet.
   a. Composite-Sheet Thickness: 0.125 inch (3.18 mm).
   b. Subsurface Graphics: Slide-in changeable insert.
   c. Color: As selected by Architect from manufacturer's full range.
   d. Provide melamine backplates to match signs where panel signs are mounted on glass sidelites.
2. Sign-Panel Perimeter: Finish edges smooth.
   a. Edge Condition: Beveled.
   b. Corner Condition in Elevation: As indicated.
3. Mounting: two-face tape.
4. Text and Typeface: Accessible raised characters in Helvetica Medium, and Braille. Finish raised characters to contrast with background color, and finish Braille to match background color.
5. Sign Types:
   a. Directional Signs: Use Helvetica Medium.
      1) Locations: As indicated.
   b. Room Identification:
      1) Room Title: Use Helvetica Medium.
      2) Room Number: Helvetica Medium, text in upper case only.
      3) Braille size: Grade II.
      4) Locations: Adjacent to all doors.
   c. Room Number Sign:
      1) Use Helvetica Medium, text in upper case only.
      2) White letters with black background.
      3) Locations: Located on upper door frame, centered, at all doors.
   d. Restroom Signs: Use Helvetica Medium, text in upper case only.
      1) Raised symbols for Boys/Girls: 4 inch high.
      2) Pictorals: 5 inch high.
      3) Locations: Adjacent to all restroom doors, in lieu of Room Identification sign.
   e. Room Capacity: Room Title: Use Helvetica Medium.
      1) Locations: As indicated.
   f. Stairwell Identification: Use Helvetica Medium.
      1) Outside the stairwell: Adjacent to stairwell doors, on the latch side.

2) Inside the stairwell: Mounted on stairwell doors.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

B. Two-Face Tape: High-bond, foam-core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides: 3M Scotch Brand VHB double stick tape.

C. Silicone Adhesive: Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

2.5 FABRICATION

A. Subsurface-Engraved Graphics: Reverse engrave back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.

B. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
1. For slide-in changeable inserts, fabricate slot. Furnish two blank inserts for each sign for Owner's use.

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 and other conditions affecting performance of signage work.

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

3.2 INSTALLATION

A. General: Provide signage as indicated, and as required to satisfy local regulation and authorities having jurisdiction.
1. Provide room identification signage at all permanent rooms and spaces, and as indicated.

B. 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.

C. Install in locations on walls at latch side of door with centerline of sign at 60 inches above finished floor, and in compliance with regulatory requirements.

D. Mounting Methods:
1. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges.
a. Apply gob of silicone sealant at the center of the sign, at appropriate substrates.
b. Place sign in position, and push to engage tape adhesive and silicone.

E. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.

3.3 ADJUSTING AND CLEANING

A. Flatness Tolerance: Sign panel shall remain flat under installed conditions as indicated and within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner.

B. 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.

C. Remove temporary protective coverings and strippable films as signs are installed.

D. 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

SECTION 10 21 13

TOILET COMPARTMENTS

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. Solid-polymer toilet compartments configured as toilet enclosures and urinal screens.

B. Related Sections:
   1. Section 06 10 00 "Rough Carpentry" for blocking.
   2. Section 10 28 00 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
   1. Show locations of cutouts for compartment-mounted toilet accessories.
   2. Show locations of reinforcements for compartment-mounted grab bars.
   3. Show locations of centerlines of toilet fixtures.

D. Samples for Initial Selection: For each type of unit indicated. Include Samples of hardware and accessories involving material and color selection.

E. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
   1. Each type of material, color, and finish required for units, prepared on 6-inch- (152-mm-) square Samples of same thickness and material indicated for Work.
   2. Each type of hardware and accessory.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of toilet compartment, from manufacturer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Comply with requirements in GSA's CID-A-A-60003, "Partitions, Toilets, Complete."

B. Regulatory Requirements:
   1. Fire Test Response: As determined by testing identical products according to the following, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency
      a. ASTM E 84.
         1) Flame-Spread Index: 75 or less.
         2) Smoke-Developed Index: 450 or less.
      b. Pass all elements of NFPA 286 room corner test.
         1) During the 40kW exposure, flames shall not spread to the ceiling.
         2) The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
         3) Flashover, as described in NFPA 286, shall not occur.
         4) The peak heat release rate throughout the test shall not exceed 800kW.

5) The total smoke released3 throughout the test shall not exceed 1,000m².

2. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1 for toilet compartments designated as accessible.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 SOLID-POLYMER UNITS

A. Manufacturers: Subject to compliance with requirements, provide one of the following products:
1. Bradley Corporation; Mills Partitions. "Bradmar".
2. Santana Products, Inc. (Scranton Products, Inc.) "Hinyhider".
3. Hadrian Manufacturing Inc.
4. Global Partitions.

B. Toilet-Enclosure Style: Floor-mounted and Overhead braced.

C. Urinal-Screen Style: Wall hung and Floor braced.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) or polypropylene (PP) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's standard continuous stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
3. Color and Pattern: One color, pattern and texture in each room as selected by Architect from manufacturer's full range.

E. Pilaster Shoes and Sleeve (cap): Manufacturer's standard design; stainless steel.

F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters with shoe and sleeve (cap) matching that on the pilaster.

G. Brackets (Fittings):
1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
1. Material: Stainless steel, unless otherwise indicated.
2. Hinges: Manufacturer's standard continuous, cam type that swings to a partially open position.
3. Latch and Keeper: Manufacturer's standard surface-mounted slide latch and paddle designed for emergency access, and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.

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 or chrome-plated steel or brass, finished to match the 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.

2.3 FABRICATION

A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

B. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

C. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.

D. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before beginning work.

B. Verify that field measurements are correct.

C. Verify correct spacing of and between plumbing fixtures and compliance with ADA required clearances.

D. Verify correct locations of built-in framing, anchorage and bracing.

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: 1/2 inch (13 mm).
   b. Panels and Walls: 1 inch (25 mm).
2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer three brackets attached at midpoint and near top and bottom of panel.
   a. Locate wall brackets 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 (44 mm) 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. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches (51 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.

D. 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 according to 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

SECTION 10 21 23

CUBICLES

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. Surface mounted overhead metal curtain track and guides.
   2. Curtains.

B. Related Sections:
   1. Section 05 50 00 "Metal Fabrications" for supports that attach curtain tracks to overhead structural system.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Show ceiling grid and overhead support or bracing locations.

C. Samples for Initial Selection: For each type of cubicle indicated. Include Samples of hardware and accessories for material and color selection.

D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
   1. Curtain Fabric: 12-inch- (305-mm-) square swatch or larger as required to show complete pattern repeat, from dye lot used for the Work, with specified treatments applied. Mark top and face of material.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For curtains and tracks to include in maintenance manuals.

B. Maintenance Materials: 2 extra curtains and 10 extra carriers.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, 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.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with cubicles by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cubicle Curtains:
   1. A. R. Nelson Co., wwwlarnelson.com.
   2. C/S General Cubicle, www.c-sgroup.com.
   3. Imperial Fastener Co., www.imperialfastener.com.
   4. Salsbury Industries, www.hospitalhardware.com.
   5. Tana-Tex, www.tana-tex.com.

B. Track: Extruded aluminum sections; one piece per cubical track run.

1. Structural Performance: Capable of supporting vertical test load of 50 lbs. without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
2. Provide end stops, T's ,Y's, etc. to fit track sections in configurations shown on Drawings.
3. Track Bends: Minimum 12 inch radius, fabricated without deformation of track section or impeding movement of carriers.
4. Finish of Exposed Surfaces: White enamel.

C. Curtain Carriers: Nylon slider or roller to accurately fit track, designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; 2 carriers per foot of track length; 1 carrier per 6 inches of fabric width.

2.2 CURTAIN

A. Performance requirements:
1. Flame spread index of 25 maximum, and smoke developed index of 450 maximum, when tested in accordance with ASTM E 84.
2. Naturally flame-resistant or flameproof; capable of passing NFPA 701.

B. Curtain material: Open weave cotton; anti-bacterial, self deodorizing, sanitized, and preshrunk. Open mesh at top of curtain shall be flameproof and color matching curtain.
1. Color: As selected by Architect from manufacturer's full range.

C. Curtain Fabrication:
1. Manufacture curtains of one piece sized 10 percent wider than track length. Terminate curtain 15 inches from floor.
2. Include open mesh cloth at top 20 inches of curtain for room air circulation.
3. Curtain Heading: triple thickness 2 inches wide, with metal grommet holes for carriers 6 inches on center, double fold bottom hem 2 inches wide. Lock stitch seams in two rows. Turn seam edges and lock stitch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and supports above ceiling are ready to receive work of this section.

B. Verify that field measurements are as indicated on Shop Drawings.

3.2 INSTALLATION

A. Install curtain track to be secure, rigid and true to ceiling line.

B. Install end caps and stop devices.

C. Install curtains on carriers, ensuring smooth operation.

3.3 ADJUSTMENT

A. Curtain Adjustment: After hanging curtains, test and adjust each track or rod to produce unencumbered, smooth operation. Steam and dress down curtains as required to produce crease- and wrinkle-free installation. Remove and replace curtains that are stained or soiled or that have stress points or diagonal folds.

END OF SECTION 10 21 23

SECTION 10 22 38

OPERABLE PANEL PARTITIONS

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. Manually operated, acoustical panel partitions.

B. Related Requirements:
   1. Section 05 50 00 "Metal Fabrications" for supports that attach supporting tracks to overhead structural system.
   2. Section 06 10 00 “Rough Carpentry” for requirements for blocking.
   3. Section 09 29 00 "Gypsum Board" for fire-rated assemblies and sound barrier construction adjacent to the operable partition.

1.3 DEFINITIONS

A. NIC: Noise Isolation Class.

B. NRC: Noise Reduction Coefficient.

C. STC: Sound Transmission Class.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.

C. Shop Drawings: For operable panel partitions.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
   3. Include diagrams for power, signal, and control wiring.

D. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.
   1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:
   1. Panel Facing Material: Manufacturer's standard-size sample, not less than 3 inches (75 mm) square.
   2. Panel Edge Material: Not less than 3 inches (75 mm) long.
   3. Chair Rail: Manufacturer's standard-size unit, 6 inches (150 mm) long.
   4. Hardware: One of each exposed door-operating device.

F. Delegated-Design Submittal: For operable panel partitions.
   1. Include design calculations for seismic restraints.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Partition track, track supports and bracing, switches, turning space, and storage layout.
   2. Suspended ceiling components.
   3. Structural members to which suspension systems are attached.
   4. Size and location of initial access modules for acoustical tile.

5. Items penetrating finished ceiling, including the following:
    a. Lighting fixtures.
    b. HVAC ductwork, outlets, and inlets.
    c. Speakers.
    d. Sprinklers.
    e. Smoke detectors.
    f. Access panels.
6. Plenum acoustical barriers.

B. Setting Drawings: For embedded items and cutouts required in other work.

C. Qualification Data: For qualified Installer.

D. Seismic Qualification Certificates: For operable panel partitions, tracks, accessories, and components, from manufacturer. Include seismic capacity of partition assemblies to remain in vertical position during a seismic event and the following:
1. Basis for Certification: Indicate whether certification is based on analysis, testing, or experience data, according to ASCE/SEI 7.
2. Detailed description of partition anchorage devices on which the certification is based and their installation requirements.

E. Product Certificates: For each type of operable panel partition.
1. Include approval letter signed by manufacturer acknowledging Owner-furnished panel facing material complies with requirements.

F. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.
1. Submit ASTM E90-97 test results from a NVLAP accredited laboratory.

G. Field quality-control reports.

H. Sample Warranty: For manufacturer's special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals.
1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
    a. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
    b. Seals, hardware, track, track switches, carriers, and other operating components.

1.8 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. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

1.9 QUALITY ASSURANCE

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

B. Product Test: For each operable panel partition, for tests performed by a qualified testing agency.
1. ASTM E90-97 test by a NVLAP accredited laboratory meeting ISO/IEC Guide 25 General Requirements and ISO 9002. Minimum dimension of test panel shall not be less than 8 feet and panel structures must include two complete modules including edge mounting elements. Test specimen must be the model specified and must be opened and closed 5 consecutive times with no adjustments made.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Faulty operation of operable panel partitions.
      b. Deterioration of metals, metal finishes, and other materials beyond normal use.
   2. Warranty Period: Two years from date of Substantial Completion.

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 seismic bracing of tracks to structure above.

B. Seismic Performance: Operable panel partitions shall withstand the effects of earthquake motions based on requirements of authorities having jurisdiction and design requirements indicated on the Drawings.
   1. The term "withstand" means "the partition panels will remain in place without separation of any parts from the system when subjected to the seismic forces specified."

C. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
   1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
   2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance according to ASTM C 423, and rated for not less than the NRC indicated.
   3. Noise-Isolation Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E 336, determined by ASTM E 413, and rated for 10 dB less than STC value indicated.

D. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following 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 E 84 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: Complying with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA.

2.2 OPERABLE ACOUSTICAL PANELS

A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
   1. Basis of Design: Subject to compliance with requirements, provide Hufcor, Inc. "~~642~~ 632," or comparable product by one of the following manufacturers:
      a. KWIK-WALL Company.
      b. Modernfold, Inc.; a DORMA Group company.
      c. Panelfold Inc.
      ~~c.~~d. Moderco.

B. Panel Operation: Manually operated, paired.

C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

E. STC: Not less than 50.

F. Panel Weight: 10 lb/sq. ft. (50 kg/sq. m) maximum.

G. Panel Thickness: Not less than ~~4~~ 3 inches (102 mm).

H. Panel Materials:

1. Recycled Content of Operable Panel Partitions:
   a. Recycled Content of Steel: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent by weight.
   b. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 10 percent by weight.
2. Steel Frame: Steel sheet, not less than 16 gauge thickness for uncoated steel.
3. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard.
4. Gypsum Board: ASTM C 1396/C 1396M.
5. Cement Board: ASTM C 1288.
6. Particleboard: ANSI A208.1, made with binder containing no urea formaldehyde.
7. Medium-Density Fiberboard: ANSI A208.2, made with binder containing no urea formaldehyde.
8. Plywood: DOC PS 1; made with adhesive containing no urea formaldehyde.
9. Composite Wood Products: Products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

I. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

1. Mechanical operators shall be by removable operating handle.

2.3 SEALS

A. General: Provide seals that produce operable panel partitions complying with performance requirements and the following:

1. Manufacturer's standard seals unless otherwise indicated.
2. Seals made from materials and in profiles that minimize sound leakage.
3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
4. Seals shall be integral with operable panels. No fixed operable panel elements shall occur at floor or jambs.

B. Vertical Seals: Deep-nesting, interlocking astragals mounted on each edge of panel, with continuous PVC acoustical seal.

1. Final closure: mechanical closure that provides 250 lbs. minimum force on seal edge.

C. Horizontal Top Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on track when extended.

D. Horizontal Bottom Seals: PVC-faced, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.

1. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 2 inches (50 mm) between retracted seal and floor finish.

2.4 PANEL FINISH FACINGS

A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
   1. Apply one-piece, seamless facings free of air bubbles, wrinkles, blisters, and other defects, with no gaps or overlaps. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
   2. Where facings with directional or repeating patterns or directional weave are indicated, mark facing top and attach facing in same direction.
      a. Match facing pattern 72 inches (1830 mm) above finished floor.

B. Carpet Wall Covering: Manufacturer's standard nonwoven, needle-punched carpet with fibers fused to backing, from same dye lot, treated to resist stains.
   1. Color/Pattern: As selected by Architect from manufacturer's full range.

C. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 24 gauge steel porcelain-enamel face.
   1. Particleboard Core: 1/2 inch (13 mm) thick; with 0.005-inch- (0.127-mm-) thick, aluminum foil backing.
   2. Laminating Adhesive: Moisture-resistant thermoplastic type.
   3. Surface shall accept magnetic aids.
   4. Height: ~~48 inches~~ As indicated.
   5. Length: Full width of operable panel.
   6. Frame: Extruded aluminum.
   7. Mounted Height: As indicated.

D. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing, finished as follows:
   1. Steel, Painted: Finished with manufacturer's color as selected by Architect from manufacturer's full range.

2.5 SUSPENSION SYSTEMS

A. Tracks: Steel or aluminum, with adjustable steel hanger rods for overhead support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54 mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
   1. Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.
   2. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.

B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
   1. Multidirectional Carriers: Capable of negotiating intersections without track switches.

C. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.
   1. Curve-and-Diverter Switches: Allow radius turns to divert panels to an auxiliary track.
   2. L Intersections: Allow panels to change 90 degrees in direction of travel.
   3. T Intersections: Allow panels to pass through or change 90 degrees to another direction of travel.
   4. X Intersections: Allow panels to pass through or change travel direction full circle in 90-degree increments, and allow one partition to cross track of another.

5. Multidirectional Switches: Adjustable switch configuring track into L, T, or X intersections and allowing panels to be moved in all pass-through, 90-degree change, and cross-over travel direction combinations.
6. Center carrier stop.

D. Aluminum Finish: Clear anodized, factory-applied, unless otherwise indicated.

E. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.6 ACCESSORIES

A. Chalk Tray and Eraser Pocket: Aluminum with clear anodic finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install blocking within terminating drywall partitions, prior to gypsum board installation.
1. Plywood blocking, as indicated.

3.2 EXAMINATION

A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.

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

3.3 INSTALLATION

A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.

B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.

C. Install panels from marked packages in numbered sequence indicated on Shop Drawings.

D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

E. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

F. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals. Perform test and make adjustments before NIC testing.

3.4 FIELD QUALITY CONTROL

A. NIC Testing: Owner will engage a qualified testing agency to perform tests and inspections.
1. Testing Extent: Testing agency shall randomly select three operable panel partition installation(s) for testing.
2. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E 336, determined by ASTM E 413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.

B. An operable panel partition installation will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust to operate smoothly and easily, without binding or warping.

C. Verify that safety devices are properly functioning.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 10 22 38

SECTION 10 26 00

WALL AND DOOR PROTECTION

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. Wall protection units: Vinyl and stainless steel corner guards.

B. Related Sections:
   1. Section 06 10 00 “Rough Carpentry” for blocking for corner guards.
   2. Section 06 20 00 “Finish Carpentry” for metal wall finish.
   3. Section 08 71 00 "Door Hardware" for metal armor, kick, mop, and push plates on doors.

1.3 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For each wall protection unit showing locations and extent. Include sections, details, and attachments to other work.
   1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: For each type of wall protection unit indicated.

D. Samples for Verification: For each type of exposed finish required.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Certificates: For each impact-resistant plastic material, from manufacturer.

C. Material Test Reports: For each impact-resistant plastic material.

D. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each wall protection unit to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Surface-Burning Characteristics: Provide plastic wall protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store wall protection units 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 (21 deg C) during the period plastic materials are stored.
   2. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).
      a. Store corner-guard covers in a vertical position.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and

maintaining temperature at 70 deg F (21 deg C) for not less than 72 hours before beginning installation and for the remainder of the construction period.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall 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.
      b. Deterioration of plastic and other materials beyond normal use.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant acrylic-modified vinyl plastic with integral color throughout; thickness as indicated.
   1. Impact Resistance: Minimum 25.4 ft-lbf/in. (1356 J/m) of notch when tested according to ASTM D 256, Test Method A.
   2. Chemical and Stain Resistance: Tested according to ASTM D 543 ASTM D 1308.
   3. Self-extinguishing when tested according to ASTM D 635.
   4. Flame-Spread Index: 25 or less.
   5. Smoke-Developed Index: 450 or less.

B. Aluminum Extrusions: Alloy and temper recommended by manufacturer for type of use and finish indicated, but with not less than strength and durability properties specified in ASTM B 221 (ASTM B 221M) for Alloy 6063-T6.

C. Stainless-Steel Sheet: ASTM A 240/A 240M.

D. 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.

E. Adhesive: As recommended by wall protection unit manufacturer and that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 VINYL CORNER GUARDS

A. Surface-Mounted, Resilient, Plastic Corner Guards: Assembly consisting of snap-on plastic cover installed over continuous retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.
   1. Size: Nominal 2 inch each side of corner, with ¼ inch radius at corner. Four foot high, or as indicated.
   2. Basis-of-Design Product: Subject to compliance with requirements, provide SSM-20AN, by Construction Specialties, Inc, or comparable product by one of the following:
      a. IPC Door and Wall Protection Systems; Division of InPro Corporation.
      b. Pawling Corporation.

B. High-impact Acrovyn 4000 with shadowgrain texture, nominal .078" (1.98mm) thickness.
   1. Chemical and stain resistance should be per ASTM D543 standards as established by the manufacturer.
   2. Color: As selected by Architect from manufacturer’s full range of standard colors.

C. Aluminum: Nominal .062" (1.57mm) thickness.

D. End Caps: Provide top and bottom end caps at each corner guard, color to match vinyl corner guard.

E. Fasteners: Provided by the manufacturer.

F. Application: Install at all exterior corners in gypsum board construction, and as indicated.

2.3 METAL CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards: Fabricated from one-piece, formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
   a. American Floor Products Co., Inc.
   b. Acceptable Substitution: See Section 01 60 00 Product Requirements.
   2. Material: Stainless steel, Type 304.
      a. Thickness: Minimum 16 gauge.
      b. Finish: Directional satin, No. 4.
   3. Wing Size: Nominal 1-1/2 by 1-1/2 inches (38 by 38 mm), or as indicated.
   4. Corner Radius: 1/8 inch (3 mm).
   5. Mounting: Adhesive.

B. Application: Install at exterior corners in kitchens, and as indicated.

2.4 FABRICATION

A. Fabricate wall protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.

B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Fabricate components with tight seams and joints 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.

2.5 METAL FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Remove tool and die marks and stretch lines, or blend into finish.
   2. Grind and polish surfaces to produce uniform finish, free of cross scratches.
   3. Run grain of directional finishes with long dimension of each piece.
   4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

B. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

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 work.

B. Examine walls to which wall protection units 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 protection units attached with adhesive or foam tape, 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 protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. Install wall protection units 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. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.

C. Provide anchoring devices to withstand imposed loads.

D. Adjust caps as required to ensure tight seams.

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

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

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. Washroom and shower room accessories.
2. Warm-air hair dryers.
3. Childcare accessories.
4. Underlavatory guards.
5. Custodial accessories.

B. Related Sections:
1. Section 06 10 00 “Rough Carpentry” for additional requirements for blocking.
2. Section 09 30 00 "Tiling.”
3. Section 10 21 13 “Toilet Compartments.”
4. Division 26 “Electrical” for coordination of electrical requirements.

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include the following:
1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work, blocking, and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

C. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.
1. Approved full-size Samples will be returned and may be used in the Work.

D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

B. 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.

1.7 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.

1.8 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 WASHROOM ACCESSORIES AND CUSTODIAL ACCESSORIES - GENERAL

A. Basis-of-Design Product: Model Numbers indicated below are as manufactured by Bobrick Washroom Equipment, Inc. Subject to compliance with requirements, provide product indicated or a comparable product by one of the following:
1. A & J Washroom Accessories, Inc. (AJW Architectural Products)
2. American Specialties, Inc. (ASI)
3. Bradley Corporation.

B. Grab Bars: B-6806.99.
1. Satin stainless steel.
2. Peened grip.
3. Provide in sizes and locations indicated on the Drawings. At a minimum, each accessible toilet compartment in each multi-occupant restroom and each single-occupant restroom receives one 36-inch horizontal grab bar, one 42-inch horizontal grab bar, and one 18-inch vertical grab bar. Each ambulatory accessible toilet compartment receives two 42-inch grab bars. Each accessible shower stall receives one horizontal grab bar and one 18-inch vertical grab bar.

C. Sanitary Napkin Dispenser: B-2800 x 50 cents operation.

D. Sanitary Napkin Disposal:
1. Surface-mounted: B-270.
2. Partition-mounted (serves two compartments): B354.
~~2.~~3. One per single-occupant restroom (unless specifically designated for Men), one per toilet compartment in multi-occupant restrooms for Women, and as indicated on Drawings.

E. Shower Seat: B-5181. One per shower stall in single shower rooms, one in multi-stall shower rooms, and as indicated on Drawings.

F. Shower Curtain Rod: B-207. One per shower stall and as indicated on Drawings.

G. Shower Curtain Hooks: B204-1. One set per shower stall and as indicated on Drawings.

H. Shower Curtain: White vinyl, B204-2. One per shower stall and as indicated on Drawings.

I. Mop and Broom Holder: B-223 x 48. One per mop sink and as indicated on Drawings.

J. Hook Strip: B-232 x 24. One per room containing a shower and as indicated on Drawings.

K. Mirror: B165 series. ~~Size as indicated on the Drawings.~~18-inch wide x 36-inch high @ typical lavatory; 18-inch wide x 72-inch high @ typical full-length mirror; and as indicated on Drawings.

L. Robe Hook: B-6727. As indicated on Drawings.

2.3 TOILET PAPER DISPENSER

A. Dubl-Serv Side-by-Side Bath Tissue Dispenser, 80200 Black Translucent, by Wausau Paper. No substitutions. One per water closet and as indicated on Drawings.

2.4 PAPER TOWEL DISPENSER

A. OptiServ Roll Towel Dispenser, 86800 Black Translucent, by Wausau Paper. No substitutions.

2.5 SOAP DISPENSER

A. Clario Foam and Lotion Skin Care Dispenser, 91822-00 Black Foaming Dispenser, by BETCO Corporation. No substitutions.

2.6 PERSONAL COSTUMER

A. Personal Costumer Model No. PC550N by Magnuson Group or acceptable substitution. Install one unit on wall behind door at enclosed offices where scheduled in the Finish Schedules.

~~2.6~~2.7 ELECTRIC HAIR DRYER

A. Basis-of-Design Product: Subject to compliance with requirements, provide Bradley 2870 115v Surface Mounted Hand Dryer, or a comparable product by one of the following:
1. Bobrick Washroom Equipment, Inc.
2. World Dryer Corporation.

B. Coordinate power requirements with Division 26 Contractor.

~~2.7~~2.8 DIAPER CHANGING STATION

A. Basis-of-Design Product: Subject to compliance with requirements, provide recessed stainless steel Diaper Changing Station 100-SSE-R by Foundations Worldwide Inc., or a comparable product by one of the following:
1. A & J Washroom Accessories, Inc. (AJW Architectural Products)
2. American Specialties, Inc. (ASI)
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation.

~~2.8~~2.9 UNDERLAVATORY GUARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Plumberex Specialty Products, Inc.
2. Truebro by IPS Corporation.
3. Acceptable Substitution: See Section 01 60 00 “Product Requirements.”

B. Underlavatory Guard: Insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
1. Material and Finish: Antimicrobial, molded plastic, white.

~~2.9~~2.10 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.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10 28 00

SECTION 10 44 13

FIRE EXTINGUISHERS AND CABINETS

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. Fire protection cabinets.
   2. Portable fire extinguishers.
   3. Fire blankets.

B. Related Sections:
   1. Section 09 91 13 "Painting" for field painting fire protection cabinets.
   2. Section "Facility Fire-Suppression Water-Service Piping" for hose systems, racks, and valves.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.
   1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
   2. Show location of knockouts for hose valves.

C. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

D. Samples for Initial Selection: For each type of fire protection cabinet indicated.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Size: 6 by 6 inches (150 by 150 mm) square.

F. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

1.6 COORDINATION

A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers, and fire blanket, as indicated are accommodated.

B. Coordinate sizes and locations of fire protection cabinets with wall depths.

1.7 DELIVERY, STORAGE AND PROTECTION

A. Store fire extinguishers and cabinets away from possible damage. Blemishes and dents shall be cause for rejection.

B. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Transparent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), with Finish 1 (smooth or polished).

2.2 FIRE PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher, and fire blanket where indicated.
   1. Basis of Design: Subject to compliance with requirements, provide Larsen's Manufacturing Company semi-recessed fire extinguisher cabinet C-2409-6R and fire extinguisher cabinet with fire blanket FB3612-RL, or comparable product by one of the following:
      a. J. L. Industries, Inc., a division of Activar Construction Products Group.
      b. Potter Roemer LLC.

B. Cabinet Construction: Nonrated, and fire-rated where indicated.

C. Cabinet Material: Steel sheet.
   1. Shelf: Same metal and finish as cabinet.

D. Semirecessed Cabinet: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semirecessed cabinet installation.
   1. Rolled-Edge Trim: 2-1/2-inch (64-mm) backbend depth.

E. Cabinet Trim Material: Same material and finish as door.

F. Door Material: Steel sheet.

G. Door Style: Vertical duo panel with frame.

H. Door Glazing: Acrylic sheet.
   1. Color: Clear transparent acrylic sheet.
   2. Thickness: 1/8 inch.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
   1. Provide projecting lever handle with cam-action latch.
   2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

J. 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.
      a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER."
         1) Location: Applied to cabinet door.
         2) Application Process: Silk-screened.
         3) Lettering Color: Red.
         4) Orientation: Vertical.

K. Finishes:
   1. Manufacturer's standard baked-enamel paint for the following:
      a. Exterior of cabinet, door, and trim except for those surfaces indicated to receive another finish.
      b. Interior of cabinet and door.

2.3 FIRE EXTINGUISHERS

A. Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Provide extinguishers labeled by UL for the purpose specified and indicated.

C. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Class: A:B:C.
   2. Size: 10 pound.
   3. Finish: Baked polyester powder coat, red color.

D. Wet Chemical Type Fire Extinguishers for Kitchen: Stainless steel tank, with pressure gage.
   1. Class: K.
   2. Size: 1.6 gallons.
   3. Finish: Polished stainless steel.
   4. Temperature range: -20 degrees F to 120 degrees F.

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. Provide factory-drilled mounting holes.
   3. Prepare doors and frames to receive locks.
   4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
   1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
   2. Fabricate door frames of one-piece construction with edges flanged.
   3. Miter and weld perimeter door frames.

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 "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 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.

2.6 STEEL FINISHES

A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel. After cleaning, apply a conversion coating suited to the coating to be applied over it.

B. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).
   1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.7 ACCESSORIES

A. Fire Blanket: Fire retardant treated wool; red, 62 x 84 inch size.

B. Extinguisher Brackets: Formed steel, chrome-plated.

C. Extinguisher Theft Alarm: Battery operated alarm, 10 second delay for disarming, activated by opening cabinet door.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

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

3.2 PREPARATION

A. Prepare recesses for semirecessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire protection cabinets in locations and at mounting heights indicated.

B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
   1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire protection cabinets.
   2. Provide inside latch and lock for break-glass panels.
   3. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.

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 manufacturers 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

SECTION 10 51 13

METAL LOCKERS

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. Corridor, Staff and Art Room lockers.
   2. Physical Education lockers.
   3. Combination padlocks.
   4. Locker benches.

B. Related Sections:
   1. Section 06 41 13 “Architectural Casework” for solid surfacing material used for locker tops.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of metal locker.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.

C. Shop Drawings: For metal lockers.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Show locker trim and accessories.
   3. Include locker identification system and numbering sequence.

D. Samples: For each color specified, in manufacturer's standard size.

E. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

F. Samples for Verification: For the following products, in manufacturer's standard size:
   1. Lockers and equipment.
   2. Locker benches.

G. Product Schedule: For lockers. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

B. A complete, original set of locker combinations and 12 master keys.

~~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. Full-size units of the following locker hardware items equal to five percent of amount installed for each type and finish installed, but no fewer than five units:~~
      ~~a. Locks.~~
      ~~b. Hooks.~~

~~c. Identification plates.~~

~~2. Provide two keys per lock and four master keys.~~

~~3. Locker Doors: 2 of each type of locker and color of door specified.~~

~~4. Touchup Paint:8 fluid ounces for each 100 lockers or fraction thereof, of each color installed, up to 1 quart total for standard colors and up to 2 quarts total for custom colors.~~

~~1.8~~1.7 **DELIVERY, STORAGE, AND HANDLING**

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

B. Deliver master and control keys to Owner by registered mail or overnight package service.

~~1.9~~1.8 **FIELD CONDITIONS**

A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

~~1.10~~1.9 **COORDINATION**

A. Coordinate sizes and locations of bases for metal lockers.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

~~1.11~~1.10 **WARRANTY**

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures.
   b. Faulty operation of latches and other door hardware.
2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain metal lockers, benches and accessories from single source from single locker manufacturer.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Art Metal Products.
2. DeBourgh Mfg. Co.
3. List Industries Inc.
4. Lyon Workspace Products, LLC.
5. Penco Products, Inc.
6. Republic Storage Systems Company.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

1. Provide accessible lockers at approximately 5 percent of the total lockers, as indicated.

2.3 CORRIDOR, ~~AND~~ STAFF AND ART LOCKERS

A. Doors: One piece; fabricated from 14 gauge steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

1. Door Style: Vented panel as follows:
   a. Louvered Vents: No fewer than six louver openings at top and bottom for single-tier, or three louver openings at top and bottom for double-tier lockers.

B. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:

1. Tops, Bottoms, and Sides: 16 gauge.
2. Backs: 18 gauge.
3. Shelves: 18 gauge, with double bend at front and single bend at sides and back.

C. Frames: Channel formed; fabricated from 16 gauge steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
1. Cross Frames between Tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.

D. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.
1. Manufacturer's standard, steel, continuous or knuckle type.

A. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.
1. Multipoint Latching: Finger-lift latch control designed for use with built-in cylinder locks or padlocks; positive automatic latching and prelocking.
a. Latch Hooks: Equip doors 48 inches (1219 mm) and higher with three latch hooks and doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

B. Locks: Cylinder locks.

C. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high. Number locks in sequence.

D. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated, attached with at least two fasteners.

E. Continuous Sloping Tops: Fabricated from 18 gauge steel sheet, with a pitch of approximately 20 degrees.
1. Closures: Vertical-end type.

F. Recess Trim: Fabricated from 16 gauge steel sheet.

G. Filler Panels: Fabricated from 16 gauge steel sheet.

H. Boxed End Panels: Fabricated from 16 gauge steel sheet.

I. Materials:
1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

J. Finish: Powder coat.
1. Manufacturer’s standard process, achieving minimum dry film thickness of two mils.
2. Color: As selected by Architect from manufacturer's full range.

2.4 ATHLETIC LOCKERS

A. Perforated Doors: One piece; fabricated from 14 gauge steel sheet with manufacturer's standard perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
1. Ventilation area shall be not less than 25 percent of gross door surface.

B. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
1. Tops and Bottoms: 16 gauge, with single bend at edges.
2. Backs: 16 gauge.
3. End Panels: 14 gauge.

a. Provide horizontal intermediate bracing for dimensions more than six inches wide, at 16 inches o.c.

4. Shelves: 18 gauge, with double bend at front and single bend at sides and back.

C. Unperforated Sides: Fabricated from 16 gauge nominal-thickness steel sheet.

D. Frames: Channel formed; fabricated from 16 gauge nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.

1. Cross Frames between tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.

E. Reinforced Bottoms: Structural channels, formed from 16 gauge steel sheet; welded to front and rear of side-panel frames.

F. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Manufacturer's standard, steel, continuous or knuckle type.

G. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.

1. Multipoint Latching: Finger-lift latch control designed for use with padlocks; positive automatic latching and prelocking.

a. Latch Hooks: Equip doors 48 inches (1219 mm) tall and higher with three latch hooks and doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 12 gauge steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.

b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

H. Locks: Cylinder locks.

I. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.

J. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated, attached with at least two fasteners.

K. Recess Trim: Fabricated from 16 gauge steel sheet.

L. Filler Panels: Fabricated from 16 gauge steel sheet.

M. Boxed End Panels: Fabricated from 14 gauge nominal-thickness steel sheet.

N. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

A. Finish: Powder coat.

1. Manufacturer’s standard process, achieving minimum dry film thickness of two mils.
2. Color: As selected by Architect from manufacturer's full range.

2.5 LOCKS

A. Cylinder Locks: Built-in, flush, cam locks with five-pin tumbler keyway, keyed separately and master keyed. Furnish two change keys for each lock and four master keys.

2.6 LOCKER BENCHES

A. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.

1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick (241 mm wide by 32 mm thick), except provide minimum 20-inch- (508-mm-) wide tops where accessible benches are indicated.

a. Length: 72 inches or as indicated.

2. Laminated clear maple hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.

B. Fixed Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:
1. Tubular Steel: 1-1/2-inch- (38-mm-) diameter steel tubing threaded on both ends, with standard pipe flange at top and bell-shaped cast-iron base; with baked-enamel or powder-coat finish; anchored with exposed fasteners.
a. Color: As selected by Architect from manufacturer's full range.

C. Wall Brackets:
1. Steel brackets for use at accessible benches and as indicated:
a. Size and capacity as required for bench size and spacing.
b. Color to match fixed pedestals.

D. Materials:
1. Steel Tube: ASTM A 500/A 500 M, cold rolled.

~~2.6~~2.7 FABRICATION

A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

C. Equipment: Provide each locker with an identification plate and the following equipment:
1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
2. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
3. Triple-Tier Units: One double-prong ceiling hook.

D. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.

E. Accessible Lockers: Fabricate as follows:
1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
2. Where hooks or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.

F. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.
1. Sloping-top corner fillers, mitered.

G. Recess Trim: Fabricated with minimum 2-1/2-inch (64-mm) face width and in lengths as long as practical; finished to match lockers.

H. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

I. Boxed End Panels: Fabricated with 1-inch- (25-mm-) wide edge dimension, and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
1. Provide one-piece panels for double-row (back-to-back) locker ends.

J. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

~~2.7~~2.8 ACCESSORIES

A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

B. Anchors: Material, type, and size required for secure anchorage to each substrate.
   1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
   2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
   1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
   2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
   3. Anchor back-to-back metal lockers to floor.

B. Welded Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.

C. Equipment:
   1. Attach hooks with at least two fasteners.
   2. Attach door locks on doors using security-type fasteners.
   3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
      a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.

D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
   1. Attach recess trim to recessed metal lockers with concealed clips.
   2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
   3. Attach sloping-top units to metal lockers, with closures at exposed ends.
   4. Attach boxed end panels using concealed fasteners to conceal exposed ends of nonrecessed metal lockers.

E. Fixed Locker Benches:
   1. Pedestals: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches (1830 mm) apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.
   2. Wall brackets: Provide no fewer than two brackets for each bench, uniformly spaced not more than 48 inches apart. Securely fasten brackets to undersides of bench tops, and anchor to wall studs or solid blocking.

3.3 ADJUSTING

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that locking devices operate properly.

3.4 PROTECTION

A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

3.5 SCHEDULE

A. L-01: Academic Lockers: 12 inches wide, 15 inches deep, 36 inches high, single tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat solid-surface top.

B. L-02: CTE Locker Type 1: 12 inches wide, 15 inches deep, 24 inches high, single tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

C. L-03: CTE Lockers Type 2: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and sloped metal top.

D. L-04: CTE Locker Type 3: 12 inches wide, 15 inches deep, 24 inches high, triple tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

E. L-05: Men's Physical Education Locker: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

F. L-06: Women's Physical Education Locker: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

G. L-07: Men's Athletic Locker Type 1: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

H. L-08: Men's Athletic Locker Type 2: 24 inches wide, 18 inches deep, 72 inches high, single tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

I. L-09: Women's Athletic Locker Type 1: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

J. L-10: Women's Athletic Locker Type 2: 24 inches wide, 18 inches deep, 72 inches high, single tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

K. L-11: Staff Athletic Lockers: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 6 inch concrete base and sloped metal top.

L. L-12: Service Staff Lockers: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and sloped metal top.

M. L-13: Art Lockers: 12 inches wide, 12 inches deep, 12 inches high, triple tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

N. L-14: BASS Lockers: 12 inches wide, 15 inches deep, 24 inches high, triple tier; two singleprong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

O. L-15: Electronics Lockers: 18 inches wide, 18 inches deep, 14 inches high, triple tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

~~A. Corridor (Student) Lockers: 12 inches wide, 15 inches deep, 36 inches high, single tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat solid-surface top.~~

~~B. CTE (Student) Lockers: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and sloped metal top.~~

C. Physical Education (Student) Locker: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

D. Men's Athletic (Student) Locker Type 1: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

E. Men's Athletic (Student) Locker Type 2: 24 inches wide, 18 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

F. Women's Athletic (Student) Locker Type 1: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

G. Women's Athletic (Student) Locker Type 2: 24 inches wide, 18 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling hook; 6 inch concrete base and sloped metal top.

H. Staff Lockers: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 6 inch concrete base and flat metal top.

I. Kitchen-Staff Lockers: 12 inches wide, 15 inches deep, 36 inches high, double tier; two single-prong wall hooks and one double-prong ceiling/shelf hook; 4 inch high wood base and flat metal top.

END OF SECTION 10 51 13

SECTION 10 56 26

MOBILE STORAGE SHELVING

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. Mechanically-assisted mobile storage systems.

1.3 COORDINATION

A. Recessed Tracks: Coordinate size and location of recesses in concrete with installation of recessed tracks.

1.4 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 mobile shelving systems and accessories.

B. Shop Drawings:
   1. Include plans, elevations, sections, and details.
   2. Show shelving layout.
   3. Show location and extent of rail system including depth of slab-recess required.
   4. Show clear-aisle widths from face of carriages.
   5. Detail fabrication and installation of mobile shelving systems including methods of anchoring shelves to carriages and rails to building structure as required for seismic restraint.

C. Samples: For each exposed product and for each color and texture specified, 6 inches (152 mm) in size.

D. Samples for Initial Selection: For units with factory-applied finishes.

E. Samples for Verification: For the following products:
   1. Flat shelving.
   2. Each type of specialized shelving.
   3. Front panels.

1.5 INFORMATIONAL SUBMITTALS

A. Seismic Design Calculations: For seismic design of mobile storage shelving systems including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

B. Qualification Data: For Installer.

C. Sample Warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For mobile shelving systems to include in maintenance manuals.

1.7 QUALITY ASSURANCE

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

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of mobile shelving systems that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of metals, metal finishes, and other materials beyond normal wear.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Spacesaver Corporation Mechanical Assist High Density Storage System, or comparable product by one of the following:
   1. Adjustable Shelving Products Co., Inc.; a division of Karp Associates, Inc.
   2. Borroughs Corporation.
   3. Datum Filing Systems, Inc.
   4. Montel Inc.
   5. Bruynzeel Storage Systems.
   6. Richards-Wilcox, Inc.
   7. Spacenow! Corporation.
   8. Tab US.

B. Source Limitations: Obtain mobile storage systems including shelving from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Mobile shelving systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.3 SYSTEMS AND COMPONENTS

A. General: Provide manufacturer's standard mobile storage shelving systems and components. Where components are not otherwise indicated, provide manufacturer's standard components as required for a complete system.

B. Recycled Content of Steel: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

C. Tracks: Steel rails with tops machined to mate with guide wheels and with ends designed to provide smooth, secure continuity between sections without field welding. Provide mounting brackets, anchorage devices, adjustable leveling devices, and stops at terminations of rails to prevent carriages from running off track ends.
   1. Mounting: Recessed.

D. Carriages: Rigid frames consisting of C-shaped cold-formed steel beams and cross beams, designed to allow secure anchorage of shelving units.
   1. Carriage Width: As indicated.
   2. Carriage Length: As indicated.
   3. Wheels: Manufacturer's standard number of bearing-mounted, steel wheels, precision ground to mate with tracks.
   4. Bumpers: Provide two rubber bumpers with minimum depth of 1/2 inch (13 mm) each side.

E. Stationary Platforms: Provide stationary carriage, housing and shelving, that match mobile components, as required to complete the mobile storage shelving system.

F. Anti-Tip Brackets: Mount on carriage for engagement with track system to secure units against tipping.

G. Carriage End Panels: Full depth and height of shelving units. Provide at the operating end of each range.
   1. Material: Manufacturer's standard.

2.4 MECHANICALLY-ASSISTED SYSTEMS

A. Drive Systems: Geared transmission and chain systems with tensioning device to provide mechanical assistance and uniform movement along entire length of each carriage. Permanently shielded and lubricated.

B. Drive Shaft: Continuous tubular or solid steel shaft, capable of transmitting torque from drive system without distortion.

C. Locking Pins: Located on range end panels to allow locking of individual range carriage when depressed.

2.5 STEEL FOUR-POST SHELVING

A. Steel Four-Post Shelving: Shelving consisting of four angle-iron uprights per section, with adjustable shelves resting on shelf supports hung on uprights. Configure units for mounting on mobile carriages.

B. Shelving Units:
   1. Type: Self-supporting unit.
   2. Configuration: Closed back and ends.
   3. Shelf Styles: Provide the following styles and numbers of adjustable shelves:
      a. Flat; five shelves.
      b. Adjustable divider: Provide five adjustable partitions per shelf with hooks or tabs to fit in slots in divider shelves.

C. Uprights: Double-wall steel posts, 2 inches (51 mm) wide, 0.048 inch (1.22 mm) thick, in manufacturer's standard T-shape for common-post use or L-shape at range ends, with keyhole perforations on the inner wall at 1-1/2 inches (38 mm) o.c.

D. Steel Spacers: Provide 0.048-inch- (1.22-mm-) thick steel spacers, 3 inches (76 mm) high, welded to posts at bottom, center, and top of open units to prevent deflection.

E. Closed Back and Ends: 0.024-inch- (0.61-mm-) thick cold-rolled steel sheet.

F. Base: Manufacturer's standard for attachment to mobile carriages.

G. Adjustable Steel Shelves: 0.030-inch- (0.76-mm-) thick cold-rolled steel sheet.
   1. Shelf Supports: Full-shelf-width supports; 0.075-inch- (1.91-mm-) thick steel, minimum 3/4 inches (19 mm) high, with flange to support shelf reinforcements and with ear at each end containing two shoulder rivets with 7/16-inch (11-mm) heads spaced to set into keyhole slots on uprights.
   2. Shelf Reinforcements: Channel shapes equal in length to depth of the supported shelf; 0.060-inch- (1.52-mm-) thick steel channels, with notched ends to fit over inside lip of shelf support.

2.6 STEEL FINISHES

A. 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.

B. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to achieve a minimum dry film thickness of 2 mils (0.05 mm).
   1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.7 SYSTEM ACCESSORIES

A. Floor Lock: Key-operated floor lock capable of securing entire system. Provide two keys.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, minimum recess depth, and other conditions affecting performance of mobile shelving systems.

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

3.2 INSTALLATION

A. Level and plumb tracks to a tolerance of 0.09 inch in 120 inches (2.4 mm in 3048 mm) with no more than 0.06-inch (1.5-mm) variation between adjacent rails. Use permanent shims or non-shrink grout as indicated by manufacturer.

B. Recessed Track Systems: Solidly fill gaps between slab and rail according to manufacturer's written instructions to secure tracks and prevent movement.

1. Use floor leveling compounds to fill recess as required for minimum flooring gap at the recessed rail.

C. Carriage Installation: Mount mobile carriages on track system with anti-tip brackets engaged by rails and adjust for smooth operation. Provide non-moving carriages securely fixed to rails where indicated.

3.3 SHELVING INSTALLATION

A. Attach shelving units to carriages according to manufacturer's written instructions and as required to prevent vibration during movement.
1. Level and plumb shelving units to a tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm).

B. Starter/Adder Units: Connect groups together with standard fasteners according to manufacturer's written instructions, using concealed fasteners where possible.

C. Install shelves in shelving units at locations indicated on Drawings and according to manufacturer's written instructions.

D. Shelving Enclosure Panels: Install end panels and canopy tops with concealed fasteners.

3.4 CLEANING AND PROTECTING

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

C. Protect installed products from damage during remainder of the construction period.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain mobile storage shelving.

END OF SECTION 10 56 26

SECTION 10 71 13

EXTERIOR SUN CONTROL DEVICES

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. Plastic panel system for fixed exterior solar shades.

B. Related Requirements:
   1. Section 05 50 00 “Metal Fabrications” for metal supports for plastic panels.

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.

C. Samples: For plastic panels and trim accessories, in manufacturer's standard sizes.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer’s fabrication specifications and certification of compliance with performance requirements.

B. Warranties: Sample warranty.

1.5 PERFORMANCE REQUIREMENTS

A. Loading: Able to withstand loading without failure or permanent deformation.
   1. Wind loads: Uniform pressure of 30 psf vertically and horizontally, but not less than required to comply with the International Building Code, with wind speed of 110 mph, 3 second gust, Exposure C, and an Importance Factor of 1.15.
   2. Live Load: 20 lb/sf.
   3. Snow Load: 30 lb/sf.
   4. Combined Load: 40 lb/sf.
   5. Dead Load: as determined by the panel manufacturer.

B. Deflection and Thermal Movements:
   1. Plastic Panel System shall withstand thermal changes and building movements within the following ranges:
      a. Normal to Support: deflection not to exceed 1/200 of span.
      b. Parallel to Support: deflection not to exceed 75% of panel edge clearances.
      c. Thermal movements resulting from ambient temperature range of 120 degrees, and temperature range of 180 degrees in support steel.

C. Leakage: Panel closure system that results in zero water leakage into the plastic panels.

D. Condensation: Route condensation that occurs within the system to drain to the exterior.

1.6 WARRANTY

A. Manufacturer shall provide replacement materials for products that fail within the warranty period.
   1. Warranty Period: 10 years from the date of Substantial Completion.
   2. Product failure shall include any of the following:
      a. Yellowing: Change of yellowing index, according to ASTM E 313 greater than 10 delta.
      b. Reduction in Light Transmission: Loss of light transmission in excess of 6 percent, according to ASTM D 1003.

c. Breakage due to hail: Failure of impact test ASTM D 5628, or breakage during simulated hail of 20mm polyamide spheres impacting at a velocity of 21 m/s (energy at impact calculated at 0.831 Joul).

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

A. Basis-of-Design Product: Subject to compliance with requirements, provide Standard Grade Multiwall Sheet in color Ice, by Polygal, or comparable product by one of the following:
   1. Bayer Material Science.
   2. Gallina USA.
   3. SABIC.

B. Plastic Panel System: Cellular polycarbonate plastic panels with internal cross-brace structure.
   1. Thickness: 16 mm.
   2. Width: 48 inches.
   3. Length: As indicated.
   4. Light Transmission: 32 percent at 90 degrees, per ASTM D 1003.

2.2 ACCESSORIES

A. Sealed Edge Tape.

B. Ventilating Edge Tape.

C. Aluminum Edge Profile.

D. Sheet connector HCP Base, HCP 16 Cap, and Side Spacer: polycarbonate to match the plastic panels.

E. Perimeter tape: Manufacturer’s standard.

2.3 FABRICATION

A. To the greatest extent possible, preassemble plastic solar shade panels, perimeter tape, and trim at the factory. Ship units ready for erection.

B. Fabricate with perimeter tape on top and bottom edges (open cell ends), with ventilated aluminum tape at the bottom edge.
   1. Cover tape with UP16 Edge Profile trim.

C. Fabricate panels for installation with HCP 16 Cap and HCP Base trim, and as indicated.

2.4 FASTENERS

A. Manufacturer’s standard, with exposed fasteners matching the finish of the plastic panel system.
   1. Provide Bell Seal where fastening through the body of the panel.

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 INSTALLATION

A. Install plastic panel system with manufacturer’s fasteners and according to manufacturer's written instructions.
   1. Install panels with the solar protected layer facing out, and internal open cells running perpendicular to the building.
   2. Prepare plastic sheet panel units:
      a. Apply sealed edge tape to the upper edge.
      b. Apply ventilating tape to the lower edge.
      c. Attach aluminum edge profile.
   3. Install panels with HCP 16 Cap and HCP Base trim at joints between panels.
   4. Fasten panels to structure as recommended by the manufacturer, and as indicated.

B. Anchor components securely in place allowing for required movements. Provide separators and isolators to prevent corrosion.

C. Erection Tolerances: Limit variations from theoretical location to 0.125 inch for any member at any location. Limit offsets in theoretical end-to-end and edge-to-edge alignments to 1/16 inch for flush surfaces.

D. Remove and replace damaged panels.

3.3 CLEANING AND PROTECTION

A. Clean completed plastic panel system on all surfaces, promptly after installation.

B. Protect installed panels until final acceptance.

END OF SECTION 10 71 013

SECTION 10 74 13

CLOCKS

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. Super-scale interior wall clocks.
   2. Work of this section is not included in the Base Bid.

B. Related Requirements:
   1. Section 01 23 00 “Alternates.”
   2. Section 05 50 00 "Metal Fabrications" for miscellaneous steel supports.

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each clock component and accessory. Include the following:
   1. Manufacturer's clock face types and size charts.
   2. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
   3. Operating characteristics, electrical characteristics, and furnished accessories.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Wiring Diagrams: For power, signal, and control wiring.

D. Samples for Initial Selection: Manufacturer's standard finish materials showing full range of colors and textures available.

E. Samples for Verification: For each type of exposed finish required.

1.4 CLOSEOUT SUBMITTAL

A. Operation and Maintenance Data: To include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

B. 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.

PART 2 - PRODUCTS

2.1 CLOCKS

A. Basis of Design: Subject to compliance with requirements, provide Tower Clock, Style: P1-1084-MI, 84” o.d. of dial markings, indoor silhouette clock, by Electric Time Company, Inc., www.electrictime.com, or comparable product by one of the following:
   1. Acceptable Substitution: See Section 01 60 00 Product Requirements.

B. Materials: Dial markings and clock hands to be made of aluminum and to have a polyurethane painted finish.
   1. Color: As selected by the Architect from Manufacturer’s full range of standard colors.

B. This Article is an example only; revise to suit Project.

C. Hands and Dial Markings: As selected by Architect from manufacturer's full range of standard styles.

D. Movement: Style MI Design. 24VAC drive motor and electronics. 8 second maximum run time. Alternating hall effect switched closed loop minute impulse operation. Composite lubrication-free bearings.

E. Controls and Features:
1. Provide Type 99B remote reset control.
2. IP65 Enclosure – Indoor & Outdoor Use
3. Automatically resets clock after power failures.
4. Automatically resets clocks for daylight savings time (if required)
5. Precision Quartz Time base 4 minutes per year maximum drift.
6. Built in 100 year daylight savings time calendar.
7. 2 Line 16 character backlighted LCD display.
8. ETL listed to UL 863.
9. Power Failure Event logging.
10. Standard MI output – 4 clocks maximum standard
11. Standard 24VDC RP output -20 clocks maximum
12. Sweep Second hand output
13. Hour Strike Capability.
14. RS-232 and RS-485 output ports
15. 24 VAC hour strike output – configurable pulse output.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect substrates, supporting items and related conditions, to ensure that they are ready to receive each item, prior to commencement of installation

3.2 INSTALLATION

A. Install each item at locations indicated on drawings, as detailed, and in accordance with manufacturer recommendations.

3.3 ADJUSTING

A. Adjust clock for proper operation and accurate display of time.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain clocks.

END OF SECTION 10 74 13

SECTION 10 75 00

FLAGPOLES

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 aluminum ground-mounted flagpoles.

B. Flags.

C. Related Sections:
   1. Section 26 41 13 "Lightning Protection for Structures" for connecting wall- and roof-mounted metal flagpoles to lightning protection system.
   2. Section 26 56 00 "Exterior Lighting" for site lighting fixtures.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand the effects of gravity loads and wind loads as determined by local building code in effect for this Project or NAAMM FP 1001 “Guide Specifications for Design Loads of Metal Flagpoles,” whichever is greater.
   1. Basic wind speed: for project location as determined by the local code or the wind charts provided by the pole manufacturer, whichever is more stringent, but not less than 120 mph flagged windload.
   2. Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

C. Shop Drawings: For flagpoles. Include plans, elevations, details, and attachments to other work. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
   1. Include section, and details of foundation system for ground-mounted flagpoles.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain flagpole as complete unit, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

B. Ship to project site in one piece.

1.7 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. American Flagpole and Flag Co.
   2. Baartol Company.
   3. Concord Industries, Inc.
   4. Ewing Flagpoles.
   5. Pole-Tech Company Inc.
   6. U.S. Flag & Flagpole Supply, LP.

2.2 FLAGPOLES

A. General: Construct flagpoles in one piece, with internal halyard.

B. Exposed Height: 25 feet.

C. Aluminum Flagpoles: Provide entasis-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 0.188 inches.
   1. Taper from 6 inches at base to 3.5 inches at top.
   2. Locking cast aluminum door assembly to access halyard.

D. Sleeve for Aluminum Flagpole: 16 gauge hot dip galvanized, made to fit flagpole, for casting into concrete foundation. Provide loose hardwood wedges at top of foundation tube for plumbing pole.
   1. Provide flashing collar of same material and finish as flagpole.

2.3 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized to match flagpole-butt diameter.
   1. 0.063-inch (1.6-mm) spun aluminum, gold-anodized finish.

B. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.
   1. Halyard Flag Snaps: Provide two stainless-steel swivel snap hooks per halyard.
      a. Provide with neoprene or vinyl covers.

2.4 MISCELLANEOUS MATERIALS

A. Collar: color to match flagpole.

B. Foundation Sleeve: 16 gauge hot-dip galvanized steel tubing welded to base plate.
   1. Grounding Spike: ¾ inch, welded to base plate.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

D. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

E. Sand: ASTM C 33, fine aggregate.

F. Elastomeric Joint Sealant: Single-component neutral-curing silicone joint sealant complying with requirements in Section 07 92 00 "Joint Sealants" for Use NT (nontraffic) and for Use M, G, A, and, as applicable to joint substrates indicated, for Use O.

G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

H. Flags: Nylon or cotton, of maximum standard size suitable for use with flagpole, but not larger than 5 foot by 8 foot.
   1. One (1) United States flag.
   2. One (1) Wyoming State flag.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

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.

2.6 ALUMINUM FINISHES

A. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.1 FLAGPOLE INSTALLATION

A. General: Install flagpoles where shown and according to Shop Drawings and manufacturer's written instructions.

B. Place sleeve, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level sleeve and allow concrete to cure. Install flagpole, plumb, in sleeve.

1. Place sleeve seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.
2. Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

C. Mounting Brackets and Bases: Anchor brackets and bases securely through to structural support with fasteners as indicated on Shop Drawings.

END OF SECTION 10 75 00

SECTION 10 82 13

EXTERIOR GRILLES AND SCREENS

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. Rooftop mechanical equipment enclosures.

B. Related Sections:
   1. Section 07 92 00 – Joint Sealants.
   2. Section 09 91 13 – Painting.
   3. Division 23 – HVAC.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

C. 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 anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

D. Samples for Initial Selection: For each type of factory-applied metal finish indicated.

E. Samples for Verification: For each type of exposed finish.

1.4 INFORMATIONAL SUBMITTALS

A. Design Calculations: Submit system design calculations indicating compliance with wind speed code criteria. Indicate fastener pull out strength, panel flexural strength, deflection resistance and performance of clips, anchors and other accessories. Calculations shall bear the original stamp and signature of a Professional Engineer licensed in the State of Colorado.

B. Certification: Submit a separate certification letter stating that the indicated system design meets the specified wind speed/exposure classification criteria. Certification shall bear the original stamp and signature of the Professional Engineer who prepared the design calculations.

C. Qualification Data: For Installer.

D. Product Test Reports: For each product, for tests performed by a qualified testing agency.

E. Sample Warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: 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. Regulatory Requirements: Comply with requirements of building authorities having jurisdiction in Project location.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

B. Protect materials and finishes during handling and installation to prevent damage.

1.8 COORDINATION

A. Installer for work under this Section shall be responsible for coordination with the mechanical equipment onto which this enclosure will be mounted.

1.9 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace any part of the rooftop equipment enclosure that fails within one year.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed equipment enclosure shall withstand specified wind pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Manufacturer is responsible for the structural design of all materials, assembly and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set.

B. Design Criteria:
   1. Wind Speed and Exposure Classification: Equipment enclosure shall be designed to withstand ground wind speed in accordance with International Building Code unless more stringent code requirements apply.
      a. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with International Building code. Design wind speed of 120 mph and wind pressures per Table 1609.6.2. Exposure C.
   2. Fastening Details and Spacings: Designed by system manufacturer to meet specified wind speed criteria.
   3. Attachment system shall be designed to provide movement capability to accommodate equipment enclosure thermal expansion and thermal expansion of the mechanical equipment onto which the enclosure is mounted.
   4. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
   5. Structural Performance: Framing shall be designed in accordance with the Aluminum Design Manual to resist the following loading:
      a. ASCE 7-95 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers
      b. Wind Loads: As indicated on Drawings.

2.2 EQUIPMENT ENCLOSURE

A. General: Moveable pre-formed thermoplastic panels in an aluminum framing system, directly attached to rooftop mechanical equipment.

B. Basis of Design: Subject to compliance with requirements provide Envisor Screening Systems, by Cityscapes International, or comparable product by one of the following:
   1. Acceptable Substitution: See 01 60 00 Product Requirements.

C. Products: Stacked system, 35 inch panel system over 70 inch panel system.
   1. Panel Style: Vertical.
   2. Panel Design: Louver.
   3. Top Trim: Flat.
      a. Minimum 24 gauge metal.
      b. Finish: Match panels.

4. Color: as selected by Architect from manufacturer's full range of standard colors.

2.3 MATERIALS

A. Thermoformed Plastic Panels: Fabricated from rigid medium impact thermo-formed ABS (Acrylic Butylene Styrene) sheets.
   1. Minimum thickness: 3/16 inch (18 mm).

B. Framing: Aluminum Plate, Shapes and Bar: ASTM B 221, alloy 6061-T5 or 6063-T5.
   1. Finish: Mill.

C. Threaded Fasteners: All screws, bolts, nut and washers shall be Stainless steel.
   1. Corner assembly fasteners shall be #10-16 x stainless steel TEK screws. Length as required to develop full holding capacity of screw when fastened to Mechanical Equipment.
   2. Provide lock washer or other locking device at all bolted connections.

2.4 MISCELLANEOUS MATERIALS

A. Framing, Subframing, Plates and Clips required for a complete installation.
   1. As recommended by the manufacturer.

B. Fasteners as recommended by the manufacturer.

C. Touchup paint for framing and panels.

2.5 FABRICATION

A. General: Fabricate and finish equipment enclosures at the factory to the greatest extent possible, 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. Provide continuous interlocking panel system. Form all components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings.

C. Fabricate system so that all panels to slide horizontally to allow access to unit access panels behind.

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 EQUIPMENT ENCLOSURE INSTALLATION

A. General: Install equipment enclosures according to manufacturer's written instructions in orientation, sizes, and locations indicated. Anchor components securely in place, with provisions for thermal and structural movement.

B. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

3.3 ERECTION TOLERANCES

A. Maximum misalignment from true position: ¼ inch.

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, following installation.

B. On completion of metal panel installation, clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

C. Replace components that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 82 13

SECTION 11400

FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the following:
Foodservice equipment.

B. Related Documents:
All drawings, general, special and/or supplementary conditions, Division 1, specifications and related documents apply to this specification. The Foodservice Consultant for this project is 3PM DESIGN. The consultant is responsible to the Project Architect and the Owner to ascertain that the F.E.C. complies with all the requirements of this section.

1.02 DEFINITIONS

A. The following definitions are intended to clarify the relationships involved in this document and are used as a definition throughout this foodservice specification.
Foodservice Equipment Contractor (F.E.C.): The F.E.C. is the party responsible for the supplying, delivering (including freight, staging and local warehousing as required), assembling, setting in place, installing, cleaning, sanitizing and/or the polishing of any foodservice item(s) included in this contract, but not limited to all required materials and labor, pursuant to the guidelines and time lines scheduled and/or rescheduled by the Owner, Architect and/or 3PM DESIGN.
Sub-Contractors: The F.E.C. may contract Sub-Contractors to perform any portion of the contract, but the final responsibility for the proper performance of the contract rest solely with the F.E.C.
General Contractor / Construction Manager (CM/GC) has the responsibility for overall installation, scheduling, deliveries, coordination of various trades, rough-in and connection of utilities, including but not limited to all labor and materials for said rough-ins and connections for all equipment in this contract unless otherwise specified, by item, within the equipment data specification sections of this contract. The F.E.C. must coordinate his/her activities and needs with the CM/GC in a timely manner as not to delay the project.
The F.E.C. is the party responsible for all taxes, tariffs, duties and/or custom fees and permits where applicable, as may be required.
N.I.F.C. - Whenever the abbreviation N.I.F.C. is used in this contract, it shall mean the item or items are not part of the Foodservice Equipment Contract.
The assignments and/or responsibilities as outlined in this section are subject to change at the Owner/Architect discretion.

1.03 INTERPRETATIONS

A. Plans and Specifications:

Should it appear that the work intended to be described or any of the matters relative thereto are not sufficiently detailed or explained on the drawings or in the specifications, the Contractors shall apply to 3PM DESIGN / Architect for such drawings or explanations as may be necessary and shall conform to them as far as they shall be consistent with original drawings.

If any question arises regarding the true meaning of the drawings, specifications and/ typographical errors reference shall be made to 3PM DESIGN / Architect whose decision shall be conclusive.

In no instance shall a bid be submitted or any work started with any uncertainty.

Before doing any work or ordering any materials, the Contractors shall verify all measurements of any work and shall be responsible for their correctness. Any differences which may be found shall be submitted to 3PM DESIGN / Architect for consideration before proceeding with the work.

Extra compensation will not be allowed because of differences between actual dimensions and measurements indicated on the working drawings.

Where a conflict occurs between or within standards, specifications, codes, ordinances and/or working drawings the more stringent or higher quality requirements shall apply.

B. Applicable Documents:

Bidding Documents, Contract Forms and related materials issued by 3PM DESIGN, the Project Architect, CM/GC and/or the Owner before awarding a contract apply to this section.

Architectural, Mechanical, Electrical and Structural Plans and other Specifications including all supplements issued thereto and other pertinent documents issued by 3PM DESIGN, the Project Architect, C.M. and/or the Owner, are a part of these Specifications and the accompanying foodservice equipment plans and shall be complete within every respect. All the above included herewith, will be issued separately by C.M., or is on file at 3PM DESIGN / Project Architect's office and shall not relieve the Contractors of responsibility or be used as a basis for additional compensation due to omission(s) of Architectural, Structural, Mechanical, Plumbing or Electrical details from foodservice equipment documents.

C. Base Bids and Substitutions: Base bids shall be for furnishing all primary manufacturer, equipment and material as specified. Failure to furnish bids exactly as specified may disqualify bidder.

Bidders may request to quote on substitute products, which include additional listed manufacturers. Substitution requests must be supplemented by sufficient information in the form of manufacturer's technical specifications, drawings, pictures and/or samples to evaluate equality, appearance and all other related conditions.

Written substitution requests must be submitted to 3PM DESIGN for approval or rejection, no less than seven (7) business days prior to bid date or in accordance with the guide lines and time lines as set forth by the Project Architect and/or Owner. No substitutions will be considered after this time. Substitutions will not be allowed without prior written approval from 3PM DESIGN.

All submittals for proposed substitutions must be submitted with an equipment data sheet for each item. The data sheet shall consist of the project name, the Project Architect, the Foodservice Consultant, the firm submitting, the item number, the

manufacturer, the manufacturer's model number, a complete written description of what is to be provided, an accessories and options list of what is to be provided, finishes, dimensions, utility requirements as provided (ie gas: natural or lp, electrical: voltage/phase and amps, plumbing/mechanical: water/sewer, etc.) as well as type of connection. The data sheet shall have a blank space (3-1/2-inches wide x 5-inches high) in the lower right corner of the sheet for stamping, etc. This information must be submitted not less than fifteen days from the bid due date to be considered as an alternate.

Where substitutions are made by the F.E.C. with the written approval of 3PM DESIGN / Project Architect, the F.E.C. shall be responsible for and pay all costs of any consequential modifications which may result from the substitution.

If the F.E.C. decides to submit an alternate manufacturer and receives a written response from 3PM DESIGN / Project Architect accepting this change, then all resulting expenses incurred in the changes or additions to the food service equipment work as well as other contractors work shall be the sole responsibility of the F.E.C. and shall be considered as part of the base bid with no additional compensation permitted.

The Manufacturer and model number of any article, device, material and/or form of construction listed in the "Itemized Specifications" as the "Primary Manufacturer" shall establish the "Basis of Design and Specification Standard", with respect to the physical dimensions, characteristics, aspects, capacities, performance and/or quantities required herein. If F.E.C. chooses to utilize one of the approved listed manufacturers then they must provide submittal information to 3PM DESIGN for analysis and conclusive determination with respect to that item.

Accepted substitutions will be noted in an addendum issued by the PA/E. No other substitutions and/or deviations from the primary manufacturer will be permitted subsequent to the date of the Bid Opening, except by specific change order and only with sufficient cause. The approval of a substitution does not approve, relieve and/or change the Contractors responsibilities as outlined herein.

D. Intent:

It is the intent of the Contract Documents for each and every item and/or component to be complete with all required devices and standard features necessary for that item and/or component to properly function.

It is the intent of the Contract Documents for each and every item and/or component to function and perform in a manner equal to the Primary Manufacturer's intent. F.E.C. is required to notify 3PM DESIGN / Project Architect in writing of any or all discrepancies or omissions of any components prior to submitting bid.

Failure of the F.E.C. to report any discrepancies and/or omissions prior to submitting his bid shall not relieve the F.E.C. of his responsibilities for providing complete, functioning, workable systems in full accordance with the intent of the Contract Documents.

E. Responsibility Matrix:

The following represents the basic contractor responsibilities for this project. The assignments and/or responsibilities as outlined in this section are subject to change at the Owner/Architect discretion.

Abbreviations:

a. CM - Construction Manager

b. GC - General Contractor
c. FEC – FoodService Equipment Contractor
d. PC- Plumbing Contractor
e. EC - Electrical Contractor
f. MC - Mechanical Contractor
g. MWC - Millwork Contractor

Task	Responsibility
Project Coordination	CM/GC*
Permits (Health Department)	ARCH/OWNER
Construction Schedule	CM/GC/ARCH
Coordination of Inspections (Foodservice)	FEC
Demolition of Kitchen Equipment (If Required)	FEC
Wall Repairs (If Required)	CM/GC
Rough-In Drawings	FEC
Rough-Ins (Required Service to Utility Connections Noted on FEC Rough-In Drawings)	PC/EC/MC
Tile Work	CM/GC
Stainless Steel Wall Panels	FEC
FRP (Wall Panels)	CM/GC
Furnish of Specified Equipment	FEC
Liquor Dispensing System (If Required)	FEC
Beverage Raceway and Conduits (If Required)	FEC
Beer Systems (If Required)	FEC
Bulk CO2 System (If Required)	FEC
Indirect Wastes Extend From Equipment to Drains	PC
Installation of Foodservice Equipment	FEC
Final Utility Connection	PC/EC/MC
Utility Interconnections	PC/EC/MC
Trim and Seal Foodservice Equipment	FEC
Clean-Up of Foodservice Areas	FEC
Walk-In Refrigeration Floor Insulation	FEC
Walk-In Refrigeration Sub-Floor and Finished Floor	CM/GC
Walk-In Refrigeration Lighting	FEC Furnished, EC Installed
Ceilings	CM/GC
Floor Troughs	FEC Furnished, PC Installed
Floor Sinks, Floor Drains, Funnel Floor Drains	PC
Mop Sinks, Hand Sinks	PC (Unless otherwise specified)
Bar Scupper Trough (Located by FEC)	MWC
Foodservice Sneeze Guards	FEC (Unless otherwise Specified)
Insulation of Piping	PC

* Or as specified in general specifications as prepared by the Architect.

1.04 SCOPE

A. Work Included:

Work required under this section consists of providing all necessary services, tools,

equipment, material and labor required to provide the continuous installation (the term installation shall mean the complete installation including, but not limited to, the delivery of all food service equipment items and necessary components complete with transportation charges and taxes prepaid by the F.E.C. to the job site's location) as designated on the food service equipment plan, uncrated, erected, set in place, leveled and made ready for final connection, by CM/GC, to plumbing, gas, electrical and/or steam utilities and properly anchored and/or trimmed as may be required.

F.E.C. is to deliver all parts and/or components, which are to be built into cast-in-place concrete and/or masonry in ample time for inclusion in the concrete and/or masonry work. Furnish necessary setting plans and/or instructions, oversee the installation of all parts in the masonry and/or concrete and be responsible for the correctness and accuracy of the location and installation.

F.E.C. to provide holes, ferrules and/or stainless steel chases on equipment for pipes, drains, electrical outlets, conduits and similar items as may be required to coordinated and accommodate the installation of the food service equipment in connection with the work of other contractors.

F.E.C. to provide the necessary materials, labor, services and incidentals necessary for the completion of these sections of work including but not limited to adhesive, caulking, sealing, trim strips, chases, corner guards, corner trims and/or closure panels.

F.E.C. to provide items and components hereinafter specified and/or shown on plans, completely assembled or erected in locations indicated, ready for final connections to service, by the respective trades. The labor and material(s) required for final connections are the responsibility of CM/GC

F.E.C. to provide and install where required fasteners, flashing, trim strips, filler panels, cant strips and caulking and/or sealant required to complete the installation.

All roof, wall and/or floor assemblies including finishes (as specified herein), penetrations, openings, curbs, platforms and/or dunnage pursuant to the requirements of the food service ventilation and/or refrigeration items are to be provide and installed by the CM/GC unless specified otherwise.

Keep premises clean and remove from the site all crates, cartons and other debris resulting from the work. Leave all areas "broom cleaned" and all equipment items and furnishings "construction clean". Final cleaning, sanitizing and polish of all equipment items and furnishings shall be done by the F.E.C. Further, it is the F.E.C.'s responsibility to provide protective coverings for all equipment items delivered to the job site during construction.

B. Related Work of Other Contractors:

General Construction by CM/GC

a. All floor assemblies including finishes, openings, depressions, sleeves, curbs and bases;
b. All wall and/or partition assemblies including finishes, openings, recesses, sleeves, furring and backing;
c. All ceiling assemblies including finishes, openings, soffits, access panels, fire separation and sleeves;
d. All roof assemblies including finishes, openings, curbs, platforms and dunnage;
e. All structural supports or grounds for hanging or fastening of food service equipment assemblies as may be described in this section;

f. CM/GC to provide on-site storage trailer(s) and security for owner's existing and/or F.E.C. provided food service equipment to be used on this project, if applicable.

Plumbing by CM/GC:

a. Water, gas and steam supply systems, as required;
b. Sanitary and grease laden drainage systems;
c. Final plumbing connections including mounting of drains, faucets, pre-rinses, hoses and piping from point of connection on equipment to building plumbing systems and interconnections between equipment components. Install all hoses from utility raceways to connection points on equipment;
d. Grease traps.
e. Indirect drain line runs from equipment items to nearest floor drain or floor sink as required;
f. Gas, water and steam pressure reducing valves and all other fittings as required.
g. Gas shut off valve(s) as required for ventilator fire suppression system and gas regulators on individual pieces of gas fired equipment in accordance with the manufacturer's recommendations are to be provided by the F.E.C. and installed by the CM/GC;
h. F.E.C. to furnish faucets with nipples, elbows, supply lines and valve stops, drains and/or splash mounted vacuum breakers, etc. for each equipment item as specified herein. Items to be installed by the CM/GC;
i. All exposed plumbing related to or in connection with food service items to be chrome plated;
j. Indirect wastes shall be chrome plated and are to drip over and into floor drains. Where drains and/or supply lines run under equipment provide the proper support from the underside of the equipment to eliminate interference with cleaning and/or maintenance.
k. When the Exhaust Hood Systems are to be furnished and installed by Division 15, and are not to be included as part of the F.E.C. work, Division 15 shall provide and install the gas valve in the main supply line serving the cooking equipment to shut-off gas service to the cooking equipment in the event of fire system actuation. This work must be coordinated with the F.E.C. and in accordance with NFPA 17A, and NEC. This work shall be further provided in accordance with this specification.

H.V.A.C.

a. CM/GC to provide and install all necessary components as may be required for the exhaust/make-up air system(s) and condensate exhaust air system including but not limited to the fans (unless provided by the F.E.C.), ducting, gas shut-off valve(s), curbs, penetrations, dampers, controls and/or switches unless otherwise specified herein;
b. CM/GC to provide and install as required rated chase(s) as well as other separations as may be required;
c. CM/GC to provide and install all heating, ventilating and air conditioning systems except as otherwise specified in this section.

Electrical by CM/GC:

a. All electrical distribution, lighting and power systems except otherwise specified in this section;

b. Final electrical connections and inter-connections including labor and materials from point of connection on equipment to building electrical systems and required interconnections between equipment components;
c. All electrical materials including wire, conduit, over current protection, main switches, safety cut-outs, shunt-trip breakers, disconnect switches, lightning control devices, surge protectors, uninterruptible power units and controllers;
d. Shunt-trip breakers and/or contactors and all conduits for shut down of electrically operated cooking equipment and/or ventilation equipment as required for ventilator fire suppression system.
e. Empty conduit systems for refrigeration system, as specified and/or shown on food service drawings.
f. Empty conduit system for point-of-sale system, as specified and /or shown on food service drawings.
g. Empty conduit system for fire suppression system, as specified and/or shown on food service drawings.
h. F.E.C. shall furnish all electrically operated portable and/or movable equipment items with factory installed 3-wire or 4-wire heavy duty insulated cord with a grounded plug with one leg of the cord grounded to a conductible portion of the items frame;
i. Furnish and install switches and/or disconnects within equipment, contactors, combination starters with fused disconnects, controls and similar items necessary for the safe and proper operation of the equipment and for compliance with all N.E.C. and/or local AHJ requirements.
j. All switches, disconnects and/or control devices shall be safely accessible without reaching across or over any hot and/or hazardous equipment items.
k. F.E.C. to secure cords, to the underside of the equipment, on portable and/or movable equipment as to allow ease of maintenance or as required by the Owner.
l. Install all electrical cord sets as provided by the F.E.C. as part of the foodservice equipment, install all cord sets from utility raceways to connection points on equipment.
m. When the Exhaust Hood Systems are to be furnished and installed by Division 15, and are not to be included as part of the F.E.C. work, Division 16 shall furnish and install automatic power disconnect devices (shunt trip breakers, or definite purpose contactors) with interlock to fire system micro switch, to shut off all power below the hood (including control voltage) in the event of fire system actuation. This work must be coordinated with the F.E.C. and in accordance with NFPA 17A, and NEC.

1.05 RELATED WORK BY OWNERS

A. Install Owner furnished equipment in accordance with the installation section of this document, unless otherwise specified herein.

1.06 QUALITY ASSURANCE

A. Food Service Consultant:

The Owner has employed 3PM DESIGN, as the Food Service Consultant. The "chain of

command" shall be the Foodservice Equipment Contractor, to the General Contractor / Construction Manager, to the Project Architect (PA / E), to the Foodservice Consultant, and vice versa in all matters concerning the foodservice equipment.

1.07 EQUIPMENT

A. Equipment, with the exception of "buy-out" or standard catalogue items, shall be fabricated in a plant bearing the name of a recognized foodservice equipment fabricator. This fabricating firm shall have been in business at least five years, with a suitable organization to design, engineer, manufacturer, deliver and install the equipment. Said installation shall be accordance with local union conditions when applicable. Such firms shall be able to refer to other successful installations of similar operating conditions. Further, the fabricator shall be able to UL classify and list the items that they fabricated. Under no circumstances shall the F.E.C. sublet any portion of the fabricated equipment to any sub-contractor without the 3PM DESIGN written approval. All fabricated food service equipment with inter-wiring and/or pre-wired equipment and/or refrigeration shall be manufactured by a fabricator that can UL list (or other applicable AHJ listing) and/or classify their own work.

1.08 LABOR

A. All labor shall be performed by experienced mechanics in this type of work. All work on the premises shall be done at such time as to promote the proper conduct of the project. Provide a competent on-site superintendent to supervise the work and to provide other trades with such information necessary to maintain proper conduct and timely completion of the work.

1.09 FOOD SERVICE EQUIPMENT CONTRACTORS

A. The preferred Foodservice Equipment Contractor shall be the pre-approved listed on page 11400-2.1.

1.10 CODES, LAWS, AND STANDARDS

A. General Requirements:

Manufacture and install equipment in conformance with the Williams-Steiger Occupational Safety and Health Act of 1970, or other Local/National safety and health regulations as applicable.

Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

a. National Fire Protection Association (NFPA)
b. NFPA 96-Installation of equipment for removal of smoke and grease-laden vapors from commercial cooking equipment, current edition.
c. NFPA 17 -Dry chemical extinguishing systems, current edition.
d. NFPA 17A-Wet chemical extinguishing systems, current edition.
e. NFPA 70-National Electric Code.
f. National Sanitation Foundation (NSF)
g. Underwriter's Laboratories, Inc. (UL), including but not limited to UL-300
h. National Electric Manufacturers Association (NEMA)
i. American Gas Association (AGA)

j. American Society for Mechanical Engineers for Steam Equipment
k. National Fuel Gas Code (NFGC)
l. State Board of Health Regulations (10-D-13)

All electrically operated and/or heated equipment, fabricated or otherwise, shall conform to the latest standards of the National Electric Manufacturer's Association and the Underwriter's Laboratories, Inc., where applicable standards have been set up by that agency, or otherwise, such as to be acceptable to authorities having jurisdiction.

Note: For projects outside the U.S., compliance is required for any and/or all governing codes and regulations as may be required by the local AHJ.

1.11 SUBMITTALS

A. General Requirements:

Shop drawings, samples and brochures must be submitted at the same time, in one complete submittal, within sufficient time not to delay work on the project and / or not over 15 days after the CM/GC has been awarded a contract by the Owner. Partial submittals will not be accepted.

2Equipment List: Submit for approval, within 15 days after notification of the Owner's award of contract, an itemized list of equipment to be furnished under this contract, to include manufacturer's name and model number, along with all necessary and/or required options and/or components, for each piece of equipment necessary only if not using primary manufacturer and if prior approval for a substitute has been let.

B. Samples:

Provide all samples of materials requested by 3PM DESIGN / Architect for test purposes or comparisons. Samples used for testing shall not be used on the work without the written approval of 3PM DESIGN / Architect.

Samples may be retained by 3PM DESIGN, the Project Architect or the Owner as a matter of record without any additional compensation to the Contractors.

Owner to provide all samples as required to F.E.C. to insure proper sizing of dispensing equipment hereinafter specified (cups, glasses, dishware, etc.).

C. Brochures:

Provide 3PM DESIGN / Project Architect, for approval, two (2) complete brochures for review showing each piece of standard manufactured equipment, only if primary manufacturer(s) are not used, complete with all details and/or descriptions of the manufacturer's specifications. Contractors will return one (1) brochure (set) with comments noted for further action. Continue submitting until final approval from 3PM DESIGN / Project Architect is achieved. After approval provide six (6) record copies in a three ring binder with such details and specifications clearly numbered with the item number as per the food service equipment plans.

Record copy brochures, shall be delivered at the demonstration and start-up, are to be bound in booklet form, in three ring binders, and shall include the following:

a. A separate data sheet for each component or item of equipment indicating item number, description, quantity, manufacturer, model number, finishes, modifications, options and utility requirements.
b. Catalog specification sheet and / or manufacturer's specifications and drawings complete including accessories. Arrange booklets so those items are in numeric

order in accord with the contract documents with each page numbered in relation to that item. Further, include with each specification sheet and/or drawing a copy of the warranty information, operations manual and service information; as well as, a completed contractor's and the food service equipment contractor's guarantee and warranty.

Provide 3PM DESIGN / Project Architect, for approval, one (1) complete bound set of operators manuals and maintenance instructions containing complete description, wiring diagrams, operating data and other information pertaining to the proper operation and up-keep for the specified items of mechanical equipment having motors or other moving parts. Continue submitting until final approval from 3PM DESIGN / Project Architect is achieved. After approval provide six (6) record copies in a three ring binder clearly numbered with the item number as per the food service equipment plans. Include names, addresses and telephone numbers of authorized service agencies for all items with mechanical equipment as well as information of local rep.

D. Shop, Rough-in, and/or Mechanical Connection Drawings:

F.E.C. is to provide 3PM DESIGN / Project Architect (1) blueprint and (1) reproducible (drawings to be sepia or translucent) set of shop drawing prints for review and comment by 3PM DESIGN. The one (1) reproducible print with comments noted will be returned for correction. Continue resubmitting as noted above until final approval by the PA / E or 3PM DESIGN is achieved. Upon final approval submit prints as required per Architect’s requirements and one (1) CADD disk of approved prints to the PA / E for distribution. Distribution to include but not be limited to the CM/GC., PA / E, Owner's Inspector, Owner's Representative, the Manufacturer, the F.E.C. and the plumber and electrical contractors.

F.E.C. to prepare rough-in drawings locating all equipment (new, existing or as provided by owner) shown on the contract documents. The rough-in requirement drawing included in these documents are provided as an instrument of service and are not to be used for construction and/or reproductions. Provide drawings, only if primary manufacturers are not used, in (6) 1/4"= (304) 1'-0" scale on sheets the same size as the contract documents, showing, with vertical and horizontal dimensions, the required rough-ins (including sleeves and conduits) for electric, gas, water, steam, sanitary waste, refrigeration, ventilation, condensation drain l lines, air and exhaust connection and wood backing for wall mounted fixtures an equipment. Show details, sections and characteristics for slab depressions and/or other features and/or installation including data for all services in each area. Locations of equipment shall allow for traps, switches, and/or other final connection requirements. All drawings shall include floor plans showing equipment as per the contract documents, elevations, details and sections as may be required-only required if not utilizing primary specified manufacturer. Provide this document if not using the primary specified manufacturer then provide the above plans showing only the items that have changed and their respective requirements.

Provide complete plans with dimensions showing locations and elevations of all plumbing, electrical and mechanical rough-ins if not using the primary specified manufacturer and item. Use same symbols, connection numbers, and dimensioning system as indicated in Contract Documents (scale shall be (6) 1/4" = (304) 1' - 0"). Provide the above plans showing only the items that have changed and their respective requirements.

In the event rough-ins have been accomplished before the award of the contract, the Food Service Equipment Contractor shall check the existing facility and furnish all, approved equipment to suit building conditions and utilities. No extra charges shall be allowed for utility changes to fit equipment during installation and connection.

Provide complete plans and details showing locations and elevations of all depressions, bases, curtain walls and hoods and any critical wall dimensions. Use same dimensioning system as indicated in Contract Documents. (Scale shall be (6) 1/4" = (304) 1' - 0")

Plumbing, electrical and mechanical rough-ins all shown on the same sheet will not be accepted.

Prior to fabrication, F.E.C. shall submit fabrication shop drawings to architect for approval by 3PM DESIGN. Shop drawings showing plan and elevations shall be (19) 3/4" = (304) 1'-0" scale, sections shall be (38) 1-1/2" = (304) 1'-0" scale covering all fabricated items. Drawings are to show location of equipment to be coordinated with each item such as boosters mounted to underside of dishtable, garbage disposers under sink compartments. The verbiage 'By Others' is not acceptable and should be defined by trade.

Fabrication details must identify all metal gauges, hardware, trim, electrical parts, special fitting and other components by manufacturer's name and model number.

Foodservice Submittal Documents are to be signed by the F.E.C. to indicate they have been reviewed and coordinated with submittals by electrical, plumbing, mechanical, millwork or other trades, and meet all contract requirements. Foodservice Submittal Documents, which are not stamped and approved by the

a. F.E.C. will be returned to as "NOT REVIEWED". The F.E.C. will be required to resubmit after review, as stated above.

E. Checking:

Checking of rough-in drawings, shop drawing, details and equipment by 3PM DESIGN is for design concept only and does not relieve the F.E.C. or CM/GC of responsibility for compliance with design drawings, details and specifications, verification of utilities with equipment requirements for conformity and location and verification of all dimensions of equipment, building conditions or reasonable adjustments due to deviations. Drawings shall be prepared on the FoodService Equipment Contractor's sheets and by his employees. Drawings of any part thereof created by photograph, paste-up, or other methods using 3PM DESIGN and/or Architect's drawing(s) and / or details is a violation of federal copyright laws and will be returned for re-submittal. F.E.C. will assume responsibility for the proper locations and sizing of sleeves, conduits, and depressions for the various equipment requirements. F.E.C. is responsible for making multiple field inspections to verify the rough-in locations prior to the pouring of concrete, the closing of walls, etc. F.E.C. shall compensate other trades for any relocation of rough-ins.

Mailing and Distribution:

All transparencies and/or prints shall be delivered in a mailing tube. Folded transparencies and/or prints shall be returned for re-submittal. After checking, supply the specified number of distribution prints for record purposes. All CADD drawings shall be on CD with all drawings formatted as a *.dwg or *.dfx file.

PART 2 - PRODUCTS

2.01 PREFABRICATED EQUIPMENT

A. Where reference is made to a manufacturer's model number and/or manufacturer's specifications, it is intended that the specifications of that primary manufacturer is utilized as a basis of design and specification standard and has become a part of these Specifications and Documents.

B. Items and /or component parts of any item referred to by manufacturer's name and model number shall be furnished complete with all standard equipment of the manufacturer used as a basis of design and specification standards plus all extras and/or modifications hereinafter specified and/or required.

C. Similar type items and/or similar type components shall be the product by the same manufacturer to facilitate maintenance, convenience and reduce the Owner's spare parts inventory.

D. Modifications to standard equipment specified shall be made by the original manufacturer, when required.

2.02 PRODUCT OR MANUFACTURER APPROVAL

A. The product of the primary manufacturer named, where more than one manufacturer is listed, was used for the basis of design and specification standard and sets the standard of quality, appearance, performance, aspect, capacities and function for that item.

B. Only products of listed primary manufacturers will be acceptable unless requests for substitutions and/or submittals of alternate manufacturers are submitted to 3PM DESIGN in accordance with stated conditions. Alternate manufacturers are approved as a manufacturer; however, each item for an alternate manufacturer must be submitted to 3PM DESIGN for approval/rejection. Refer to Article "BASE BIDS AND SUBSTITUTIONS".

C. Other manufacturers must modify their product if necessary to comply with the quality, physical and functional characteristics of the primary manufacturer and must be approved by 3PM DESIGN.

D. All manufacturers listed may not be able to supply an equipment item, pursuant to the specifications, as standardized by the primary manufacturer whose name and model number was utilized herein as the basis of design standard for this project, in which case, the listed alternate manufacturers may elect to modify an item to meet the specifications.

2.03 CONSTRUCTION

A. General:

The materials, components and techniques describe the construction of items of the Food Service Equipment.

Deviation and extra refinements peculiar to any one item will be described and/or

indicated.

It is required that all custom/fabricated items in these plans and specifications, other than by manufacturer name and model number, will be constructed of 300 series stainless steel and be manufactured by a fabricator that can UL list and/or classify their own products.

All exposed surfaces of equipment shall be free of bolts, screws and rivets. Wherever these fasteners are used they shall be an approved type constructed of stainless steel.

All tops, sink bowls, drain boards and troughs to be sound deadened. Component Hardware, Model Q75-1366 NSF approved gray latex sound deadener for brush or spray application; Model Tacky Tape for work top application between top and hat channel reinforcing.

B. Table and Countertops:

All tops are to be fabricated with 14 gauge, 300 series stainless steel one piece construction with all seams and corners welded. All intersections of three (3) or planes shall be coved. Tops to be free of all deflection, reinforced with (101) 4" x (25) 1" inverted 14 gauge galvanized iron channels with 1" flanges, stud welded to underside of tops. Two (2) channels running lengthwise under tops up to (762) 30” wide (tops over 30" wide, channels spaced maximum of 18"on center). One (1) channel running front to rear at legs and/or not more than 6'-0" on center. All intersections of channel reinforcing shall be fully welded and sealed.

Tops with open edges shall have edges formed in accordance with Details, unless otherwise specified in the itemized specifications. All open corners of edges welded in bull-nose roll.

Where the tops are adjacent to walls, columns, equipment, enclosures, etc. they shall have a splash. The standard splash shall be in accordance with Details, unless otherwise specified.

Where holes are punched through top to accommodate equipment, said holes shall be ferruled and provided with a rubber grommet.

Ends adjacent to similar equipment shall have common end post.

Bases shall be open type construction, (41) 1-5/8" O.D. stainless steel tubular legs, fitted with stainless steel bullet type, adjustable feet and enclosed conical gussets unless otherwise specified. Cross bracing shall be (41) 1-5/8" O.D. stainless steel tubular members fully welded to legs as required. Where undershelves are provided they shall be constructed of 16 gauge stainless steel, fully welded to tubular legs.

When legs are furnished with stainless steel flanged feet, they shall be sealed and secured to the finished floor with stainless steel threaded anchor bolts. Anchor bolts to be set (76) 3" into finished slab and extended to minimum height above finished floor as required for securing equipment. Equipment to be fastened down with stainless steel lock washers and nuts. Flange feet to be set in a bed of FDA approved clear silicone sealant prior to securing to finished floor. Providing a bead of sealant after securing of feet is not acceptable.

When cross bracing are furnished with stainless steel flanged feet, they shall be sealed and secured to the finished wall and/or stainless steel cabinet bases with stainless steel lock washers and nuts. Flange feet to be set in a bed of FDA approved clear silicone sealant prior to securing to finished wall and/or equipment. Providing a bead of sealant after securing of feet is not acceptable.

C. Table with Baker Top:

Top to be constructed of 3" thick maple hard wood with (101) 4" x (25) 1" stainless steel channel sub frame connected to base.

Table base, cross bracings, undershelves, splashes. etc. shall be provided as hereinbefore noted under Section 6.3.2 Table And Counter Tops, and hereinafter specified.

D. Table with Baker Top:

Top to be constructed of (38) 1-1/2" thick white anti-bacteria cutting surface with (101) 4" x (2) 1" stainless steel channel sub frame connected to base. Top to be removable for cleaning.

Table base, cross bracings, undershelves, splashes. etc. shall be provided as hereinbefore noted under Section 6.3.2 Table And Counter Tops, and hereinafter specified.

E. Enclosed Bases:

Closed base fixtures shall have rigid welded frame enclosed on all sides except where shelves and/or doors are required. Cabinet body shall be constructed of 16 gauge stainless steel

Tops shall be cross-braced with (38) 1-1/2" x (38) 1-1/2" X (3) 1/8" galvanized angles spaced at 2'-0" O.C. maximum, reinforced with 14 gauge galvanized (25) 1” x (101) 4” x (25) 1” channels wherever necessary for rigidity.

Leg channels shall be (25) 1" X (101) 4" X 14 gauge galvanized channels spaced (1219) 4'-0" O.C. maximum, on bottom, to receive legs.

Closed base fixtures shall be mounted on casters, or No. CS-58B United Show Case, Keil, Component Hardware or Haralson stainless steel adjustable counter legs, as indicated on plans and/or item specifications.

Shelf supports shall be continuous (38) 1-1/2" x (38) 1-1/2" x (3) 1/8" galvanized angles welded to frame. There shall be no exposed galvanized steel channels or supports.

Utility chases shall be 18 gauge stainless steel with removable access or service panels.

Partitions shall be 18 gauge stainless steel.

Exterior panels shall be FRP plastic laminate when a part of millwork, or stainless steel with vertical grain as specified in item specifications.

Non-exposed panels adjacent to walls or closed base fixtures shall be 20 gauge galvanized steel.

Interior shelf units shall be 16 gauge stainless steel, edges turned up (50) 2" at sides and rear, down (38) 1-1/2" at front and where shelves butt together, corners to be welded. Shelf to be fixed and constructed in accordance with Detail DET-28.02 (removable (609) 2’-0” max. sections to be provided when specified for ease of removal and cleaning).

Compressor compartments shall have removable louvered panels with (50) 2" x (19) 3/4" X 18 gauge stainless steel double channel perimeter frames, (12) 1/2" x No. 16 Niles flat stainless steel expanded metal guards, 14 gauge galvanized steel compressor mounting channels, enclosure panels.

Recessed areas shall be lined with 18 gauge stainless steel.

Plastic laminated panels shall have a (19) 3/4" thick exterior plywood base veneered on all exposed sides and edges with Wilsonart, Formica or Westinghouse Micarta plastic applied or laminated in strict accordance with manufacturer's recommendations.

Plastic laminated panels shall be without joints and grain and pattern material, color, pattern and/or texture shall be as approved by Project Architect.
Trim shall be 18 gauge stainless steel with vertical grain.
Stainless steel and brass trim shall have flush welded joints. Control panel recesses, valve handle recesses and individual control knob recesses shall be 18 gauge stainless steel. Depth must be sufficient to prevent control from protruding past face of body panel.
Legs shall be No. CS-688 United Show Case, Keil, Component Hardware or Haralson. Weld to framing members of counter. Provide (88) 3-1/2" square 12 gauge galvanized steel top plate welded on legs that are bolted onto equipment. Secure with four (4) (6) 1/4-20 stainless steel bolts.
Cashier's stations shall have 18 gauge stainless steel liners, cash drawer liners and 14 gauge stainless steel 30 degrees sloping foot rest with (254) 10" wide level tops.

F. Cold Pans:

Interior shall be 16 gauge stainless steel one (1) piece construction with all corners coved on a (19) 3/4" radius pitched to a (25) 1" stainless steel drain fitting welded to the shell. Pipe drain line to bottom of cabinet.
Exposed exteriors shall be 18 gauge stainless steel, concealed exteriors shall be 18 gauge galvanized steel.
Entire pan shall be insulated with (304) 2" thick urethane foam. Provide a non-toxic high-impact plastic breaker strip around the entire opening to prevent condensation.
Refrigerated cold pan coils shall be (12) 1/2" O.D., type K copper tube with wrought copper fittings and silver soldered joints. Space runs of coil at (38) 1-1/2" O.C. parallel to the long axis of the cold pan bottom and sides and solder in place. Runs equally spaced at (101) 4" O.C. securing the coils to the pan. After the coils are secured to the pan, cover the entire bottom and sides with thermal mastic and apply waterproof covering.

G. Cooler / Freezer Assemblies:

Wall, ceiling and floor section insulation shall be 4" thick rigid urethane. Urethane foam to have a thermal conductivity (K factor) of not more than 0.118 BTU/hr./sq. ft. per degrees Fahrenheit/inch: and an overall coefficient of heat transfer (U factor) of not more than 0.029 "R" factor shall be 34. Urethane foam when fabricated in panels shall be supplied with a fire hazard classification according to ASTM-E-84 as performed by Factory Mutual Insurance System test procedure. Panel cores shall have a flame spread rating of 25 or less and a smoke density of no greater than 450. Every panel shall bear a certifying Factory Mutual label.
Sectional assemblies: size / shapes indicated on drawings: 9'-0" overall height unless otherwise specified. Door locations shall be exactly as shown, size as specified.
Panel skin material / finish: 0.040" stucco-embossed aluminum interior and exposed exterior panel surfaces, 22 gauge galvanized concealed panel surfaces, unless otherwise specified. Beer coolers to be provided with diamond plate wall cladding as specified.
Integral Floor Panels:

a. Sandwich type panels, same construction as walls/ceilings surface, with 14 gauge stainless steel interior floor surface, sealed watertight and coved at all wall lines.
b. Field-apply (6)1/4" thick hard-alloy aluminum tread plate No. 6061-T6, with all joints caulked.

c. Shop-install (19)3/4" marine-grade plywood sub floor below the metal skin with all surfaces sealed watertight and all joints and/or seams caulked.
d. Treat exterior panel surfaces for concrete exposure.
e. Sloping interior floor ramp at entrance doors. Unless otherwise specified.

"Floorless" Assemblies (Cooler / Freezer):

a. F.E.C. shall provide and install prefabricated mounting floor screed for perimeter and partition walls when specified. Anchor floor screed to finished slab as recommended by manufacturer. Floor screed shall be level and square. F.E.C. shall provide and install prefabricated curbs for perimeter and partition walls when specified. Anchor curb to slab recess as recommended by manufacturer. Curb shall be provided.
b. General Contractor shall provide and install approved vapor barrier.
c. General Contractor shall provide and install two (2) layers (50)2" thick slab Urethane unless otherwise specified, stagger each layer, and seal with an approved mastic.
d. General Contractor shall provide a concrete slab over insulation with adequate reinforcing to receive specified finish floor and setting materials
e. General Contractor shall provide and install floor finish to match kitchen floor, coved base (127) 5-inches high at wall lines, in setting bed, as specified by the Architect, unless otherwise specified.

Provide 120 volt thermostatically controlled defrosters that shall be around the entire perimeter of the door, doorframe and sill.

Doors shall have three (3) chrome plated self-closing, cam-lift hinges, stops, hand latches with inside safety releases (panic hardware) and dead bolt locks.

Electric system shall be watertight installation with non-metallic conduit, fittings, junction boxes and face plates.

Reinforce prefabricated wall panels to rigidly support the door assemblies. Doors to be standard (914) 36" wide x (1981) 78" high unless otherwise specified. Interior door finishes in multiple compartment assemblies shall be same material as adjacent wall panels.

All hinged doors shall have (914) 36" high (3) 1/8" thick hard-alloy aluminum tread plates at exterior and interior unless otherwise specified.

Special size sections shall be constructed if changes in building dimensions, columns, or other physical obstructions will not permit standard size panel sections to be assembled as indicated on plans.

Provide with Cole Model No. FS-7085-SG enclosed / gasketed surface-mounted light fixtures with extended service lamps unless otherwise specified, in quantity and arrangement shown on drawings. Light fixtures to be vapor-proof. Lighting to provide a minimum of twenty (15243) 50 foot candles of light at any point inside (762) 30" above floor.

Light fixtures: Wired to interior and exterior compartments, 3-way Hubbel press switch per compartment, mounted in "FS" boxes with Hypalcon covers and pilot lights. Compartments with multiple entrances. Provide 4-way switches. All wiring conduit to be run on exterior of compartments.

Provide sectional removable closure panel at exposed top front and sides of box as required, of same material as exterior panel finish, complete with removable access panel. Panels to extend from top of box to finished ceiling. Panels to be solid faced,

unless otherwise specified and shown on drawings as louvered.
Provide sleeves through ceiling and walls for refrigerant lines, electric sleeves and drain line, seal the balance of opening with urethane and sealant.
Ceiling panels where the coils are located shall be reinforced. Coils shall be located where shown on the foodservice drawings.
4-(12) 1/2" diameter chrome plated, flush-mounted dial thermometer that shall be capable of calibration. All thermometers furnished with sufficient capillary tubing to extend from exterior front of the assembly to a mounting position of the sensor bulb and glycerin container within evaporator return air-stream with tubing clipped to panel.
Assembly shall be N.S.F constructed and U.L. rated and carry certifying labels (or other ratings and certifications as may be required by local AHJ).
Provide in freezer assembly a heated pressure relief port. Install pressure relief port in a wall panel away from the direct air stream flowing from the coils.
The manufacturer shall provide a ten year panel warranty for the cooler and freezer sections to be free from defects in material and workmanship under normal use and service and shall be obligated to repair or replace F.O.B., any section which proves to be defective within that period for the date of original shipment. This warranty shall not include labor and freight. This warranty shall not apply to equipment, which in the consultant's opinion, has been subjected to misuse, misapplied, or improperly installed.
When the dimensions of an insulated room are such that a single span ceiling panel is not applicable, it must be supported using an interior or exterior beam or must be supported by all thread rods secured to the building structure. Regardless of which method is used, all beams and "C"" channels shall be aluminum. Wood and steel structures, which cause added maintenance requirements, shall not be acceptable. F.E.C. shall be responsible for the complete installation of the walk-in box structure, unless otherwise noted on contract drawings.

H. Cooler / Freezer Compartments:

Condensing units shall be semi-hermetic air-cooled condensing units with rigid structural bases, dual receivers. OSHA metal fan guards / shrouds with venturi openings waterproof electrical system, exhaustible fusible plugs, internal inherent motor protection, liquid line shut off valves, oil pressure safety switches, crank-case heaters, pressure oil separators on low temperature units.
Cooler evaporating coils shall be low profile U.L. / N.S.F. as manufactured by Bohn or approved substitute, with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, permanently lubricated motors with thermal overload protection, water-proof electrical system pre-wired to single connection and slotted channel hangers. Coils are to be designed to operate not above 34 degrees.
Freezer evaporating coils shall be low profile U.L. / N.S.F. as manufactured by Bohn or equal with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, heavy duty motors with thermal overload protection, electric defrosting system, per-wired water-proof electric system and slotted channel hangers. Coils are to be designed to operate from plus 30 to minus 20 degrees temperature.
Refrigerant shall be type 404A in low temperature and Type R-22 in high and medium temperature systems.
Mounting racks shall be galvanized steel angle frames with galvanized steel floor plates. Secure in place with Phillips red head anchors or equal. Rack to be wall mounted above

cooler on exterior building wall, roof mounted or located on grade with a security cover over compressors and an approved locking device.
Control panel housing shall be Nema-4 enclosures.
Freezer control panel shall be pre-wired assembly with magnetic starters, relays, condensing unit circuit breakers, coil circuit breakers, dual pressure controls, liquid line pressure gauges, suction line pressure gauges and timer.
Cooler control panels shall be pre-wired assembly with magnetic starters, condensing suction line pressure gauges, liquid line pressure gauges and timer.
Freezer timers shall be time activated, pressure terminated type with 36 to 110 pounds adjustable range, 40 amp rated switches, heavy duty self starting motors, and 1 to 6 cycle per day defrost frequency range.
Cooler timers shall be time activated, time terminated type with adjustable 1 to 6 cycle per day, adjustable 4 to 100 minutes defrost duration, 40 amp switches and heavy duty synchronous industrial type motors.
Refrigerant circuits shall have liquid line site glasses, suction line site glasses, liquid line vibration eliminators, suction line vibration eliminators, filter dryers, automatic expansion valves, room thermostats interlocked with liquid line solenoid valves and heat exchangers.
Refrigerant lines shall be type ACR copper tubing with wrought copper fittings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil pumped) in tubing to prevent oxidation and scale formation. Refrigerant systems shall be evacuated three (3) times to a pressure of 500 microns maximum and flushed between each evacuation with refrigerant.
Refrigerant line supports shall be hanger rods (size variable), hinged pope hangers or support channels. Grade lines to compressors and install suction line trap adjacent to coil. Adjacent lines shall be parallel and straight with plumb vertical runs.
Coil drains shall be (19) 3/4" I.P.S. copper. Route and pitch (12) 1/2" per foot to external drain and secure to wall with (19) 3/4" I.P.S. cast brass or wrought copper hangers. Provide electric heaters on freezer drains. Drain lines shall be neatly insulated with (19) 3/4” thick, UL listed material similar to Armaflex. In addition, insulated drain lines shall be provided with cover of same material as compartment finish, secured to compartment walls. Drain lines shall not interfere with shelving within the compartment and shall be held to the minimum distance required to exit to an exterior drain.
Refrigeration line insulation shall be (38) 1-1/2" thick Armstrong Armaflex pipe insulation sealed with adhesive foam insulation. Tape fittings to sufficient thickness to prevent condensation.
The entire system shall be cleaned and dehydrated by maintaining a vacuum of 500 microns, or lower, for a minimum period of five (5) hours. The vacuum pump used shall itself be capable of developing a vacuum of 50 microns with its refrigerant and oil shall be added and each system shall be tested for performance.

I. Undercounter Refrigerators / Freezers:

Refrigerators/freezers shall be all metal construction with no wood. Outer shell to be constructed with 18 gauge stainless steel and be fully welded to form a vapor proof seal. Inner shell to be no less than 20 gauge stainless steel with coved corners pitched to a (25) 1" stainless steel drain fitting welded to the shell. Drain should be located as close

as possible to the blower coil.

Entire compartment shall be insulated with (50) 2" thick approved urethane insulation on all sides, top and bottom. Provide a non-toxic, high-impact plastic breaker strip around the entire cabinet opening perimeter. Provide the same heaters in freezer doors. A vinyl magnetic gasket shall be installed around the full perimeter of cabinet opening for a positive seal. Flush mount a (63) 2-1/2" diameter dial thermometer in face of cabinet.

Interior shelving to be stainless steel wire shelves mounted on adjustable clips providing four point support. Shelves shall be removable for cleaning. Provide one (1) bottom shelf and one (1) intermediate shelf, unless otherwise specified.

Doors shall be fabricated (38) 1-1/2" thick with approved foam urethane insulation. Doors shall be 18 gauge stainless steel double pan type construction with flat sides for edge mounted hardware secured to internal tapping strips in door body. Provide each door with self-closing cam lift hinges. Door(s) to actuate an incandescent shatter-proof light. Light to be mounted so as not to interfere with storage space.

Drawers, if specified, shall be mounted on stainless steel self-closing roller bearing tracks with positive stops. A vinyl magnetic gasket is to be provided around entire perimeter of drawer front for positive seal. Drawer fronts to be 18 gauge stainless steel double pan construction with urethane insulation. Provide condensate proof heating wires in cabinet mullion and the entire perimeter of drawer opening.

Refrigeration system shall be properly sized to maintain refrigerated food products at 38 degrees to 40 degrees Fahrenheit and frozen food at 0 degrees Fahrenheit.

Where undercounter refrigerators are specified and top is to have opening to receive stainless steel pans, the openings shall be die stamped. Top shall be provided with 18 gauge stainless steel double pan removable cover with urethane insulation. Cover to be furnished with gasket, stainless steel lift handle and lid cover bracket assembly, as manufactured by Component Hardware, Keil, Grant or Knape.

J. Undercounter Refrigeration Systems:

Evaporator coils for fabricated undercounter refrigerator/freezers shall be blower type coils and be installed for accessibility and replacement.

All temperature controls, expansion valves, sight glass and solenoid valves are to be installed at the time of manufacturing and mounted for easy adjustment and service.

Refrigeration circuits shall have automatic expansion valves, dual high-low pressure switches, high pressure line sight glass and line vibration eliminators.

Evaporator coils shall have the condensate drain line routed to and furnished with a condensate evaporator, as manufactured by Component Hardware, Keil, Grant or Knape. Provide wall mounting bracket if required.

Each condensing unit shall have a separate control switch with pilot light and an engraved phenolic plastic identification sign.

Refrigeration lines are to be Type ACR copper with cast fittings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil pumped) in tubing to prevent oxidation and scale formation. Refrigeration system shall be evacuated three (3) times to a pressure of 500 microns maximum and flushed between each evacuation with refrigerant. Refrigeration lines shall be insulated with Armstrong Armaflex insulation.

Refrigeration systems shall operate on Freon R-22 in high and medium temperature and

Type 404A in low temperature applications.
On remote refrigeration systems, all refrigeration piping is to be pre-piped at the time of manufacturing and routed to one (1) central location ready for a one (1) point hook-up by the Refrigeration Contractor.

K. Dishtables and Sink Section Tops:

Tops, trough, sinks, back and end splashes shall be 14 gauge stainless steel, integral all welded construction. Tops shall be reinforced with (25) 1" x (101) 4"x (25) 1" inverted 14 gauge stainless steel channels. Edges shall be constructed 3" high. Back and endsplashes at walls, 10" high, 3" return on 45 degrees, 1" turn down at wall. Top shall slope to dishmachine, sinks, troughs, cones, and drainers a minimum of (6)1/4" per foot with backsplashes and table edges remaining level. Where table top attach to dishmachine, turn down into machine and anchor securely, using only stainless steel fasteners. Front edge and rear splash at dishmachine to be watertight and welded closed. All sinks, disposer cones, sumps, troughs, or chutes shall be integrally welded with top to give one-piece appearance.
Bases shall be open type construction, (41) 1-5/8" O.D. stainless steel tubular legs, fitted with stainless steel bullet type, adjustable feet and enclosed conical gussets. Cross-bracing shall be (41) 1-5/8" O.D. stainless steel tubular members welded to legs as required.
When legs are furnished with stainless steel flanged feet, they shall be sealed and secured to the finished floor with stainless steel threaded anchor bolts. Anchor bolts to be set 3" into finished slab and extended to minimum height above finished floor as required for securing equipment. Equipment to be fastened down with stainless steel lock washers and nuts. Flange feet to be set in a bed of FDA approved clear silicone sealant prior to securing to finished floor. Providing a bead of sealant after securing of feet is not acceptable.
When cross-bracing is furnished with stainless steel flanged feet, they shall be sealed and secured to the finished wall and/or stainless steel cabinet bases with stainless steel lock washers and nuts. Flange feet to be set in a bed of FDA approved clear silicone sealant prior to securing to finished wall and/or equipment. Providing a bead of sealant after securing of feet is not acceptable.

L. Doors and Removable Panels:

Metal doors shall have 18 gauge stainless steel exteriors and interiors. Form (19) 3/4" X 90 degree edges on all sides and weld corners. Rear panels must slip inside front panels and form double pan assembly with tight joints. Doors and panels to be easily removable without tools. All doors to be provided with locking hardware with stainless steel face No. P20-0490 Component Hardware, Keil, Grant or Knape.
Insulation between panels shall be (19) 3/4" rigid fiberglass. Secure to both panels where hardware or other screw fastenings are required.
Metal doors shall have 12 gauge steel tap-in plates welded to inside of panels where hardware or other screw fastenings are required.
Sliding door tracks shall be No. 1357 Series Keil, Component Hardware, Grant or Knape. Secure with (6) 1/4-stainless steel bolts. Sliding door roller assemblies shall be No. 1358-1212-1000 Keil, Component Hardware, Grant or Knape and Vogt. Sliding and hinged door pulls to be full grip, stainless steel No. P46-1012 Component Hardware,

Keil, Grant or Knape.
Hinged doors to be hung on two (2) stainless steel lift-off type hinges No. R74-800RH and R74-8000LH Component Hardware. Doors in kitchen area fitted with full grip stainless steel pulls No. P46-1012 Component Hardware; door in servery area fitted with fabricated integral full grip stainless steel pulls. Doors to be furnished with flush mounted, concealed type, magnetic catch No. M35-1000 or M35-2000 Component Hardware. For doors measuring more than (609) 24” wide, furnish additional catch at bottom of doors. For all hardware, Keil, Grant or Knape are acceptable.
Louvered doors shall be constructed same as door except center section shall be provided with 18 gauge stainless steel fabricated louvers tack welded flush with door surface.
Removable panels shall be constructed same as door and in accordance with Health Dept.

M. Drainboards:

Bodies shall be 14 gauge stainless steel with all horizontal and vertical corners coved on a (19) 3/4" radius with junction forming a one quarter hemispherical cove.
Bottom of drain board shall slope (6) 1/4" per foot to sink tubs.
Rims of freestanding drain boards shall match sink rims and form straight horizontal edges.
Front edges of rims of freestanding drain boards shall be (76) 3" deep at highest point.
Exposed corner edges of rims shall be rounded on a (76) 3" radius.
Rear and end splash of freestanding drain boards adjacent to walls or closed fixture shall be (1117) 44" above floor at rear and sloped to front at 45 degrees as shown in details.
Drain boards over (762) 30" long shall have open bases. Bases shall be integral part of free standing sink bases.

N. Sinks:

Construct sinks of 14 gauge stainless steel forming corners with a (19) 3/4" radius, both horizontal and vertical. Sink sizes established on the drawings by 3PM DESIGN shall be inside measurements.
Provide double wall partitions between sink compartments with (19) 3/4" radius corners, (19) 3/4" radius top edge, integrally welded in place, ground smooth and polished. Fronts, bottoms and backs of multiple sinks shall be one piece with no overlapping joints and/or open crevices. The bottom of each sink shall be creased to the center and fitted with a lever operated rotary waste drain with strainer plate, chrome plated tail piece and over flow pipe. The rotary waste drains shall be set into a (12) 1/2" deep recess assuring complete draining. Over flows shall be fitted in the back of the sink to maintain a constant water level 1" below the sinks top edge.
Where sinks occur in tables, sinks are to be integrally welded and polished as above.
Provide all required holes for faucets, vacuum breakers, chemical supply lines, etc.

O. Sinks (Drop-in Type):

Construct sinks of 14 gauge stainless steel forming corners with a (19) 3/4" radius, both horizontal and vertical and (38) 1-1/2” wide perimeter flange. Sink sizes established on the drawings by 3PM DESIGN shall be inside measurements.

P. Drawers:

Drawer liners shall be 18 gauge stainless steel; (508) 20” x (508) 20” x (127) 5” deep removable insert pan No. S81-2020 for tool drawers; (508) 20” x (508) 20” x (254) 10” deep No. S83-2020 for bread drawers, as manufactured by Component Hardware. Pans to be easily removable without removing frame or un-tracking drawer.

Supporting drawer frame shall be 14 gauge stainless steel welded channel. Drawer faces to be 18 gauge stainless steel double wall construction fully welded with insulation between. Face to be welded to drawer supporting frame. Drawers furnished in kitchen area to be fitted with full grip, stainless steel pulls No. P46-1012 Component Hardware; drawers furnished in servery area to be fitted with fabricated integral full grip, stainless steel pulls.

All drawers shall be provided with adjustable replaceable rubber stops.

Drawers are to be enclosed in 16 gauge stainless steel housing under open base tables to make them vermin proof.

Drawer slides shall be Component Hardware No. S52 Series, 14 gauge stainless steel slides mounted on 14 gauge stainless steel supporting channel frame fitted with stainless steel ball bearing wheels. Slides to be of a self-closing type sufficient length to allow drawer liner to be removed without removing slides. Drawer shall support a minimum of 150 pounds capacity at fully opened position.

Drawer shall have keyed, locking hardware, stainless steel faced No. P30-4700 Series as manufactured by Component Hardware.

Anti-Bacteria, NSF approved cutting board to be Chef’s Edge with Microban (457) 18”x (609) 24” with (101) 4” x (25) 1” handle slot as manufactured by C&K Manufacturing or approved equal. Cutting board to be mounted on 14 gauge stainless steel channels.

Q. Drainer Pans:

Drainer pans shall be constructed of 14 gauge stainless steel welded integral with tops.

Drainer pans shall be a recessed integral part of top with cove corner bodies that slope to drains.

Drainer with disposer.

Drainer with removable strainer for pot and pan sinks without disposer.

Drainer with removable strainer for counter tops and drop in.

Drainer with removable strainer secured with tamper-proof fasteners.

Drainer pan recess fitted with strainers located below each glass filler, urn faucet, beverage dispenser, ice dispenser or draft beer spigot.

Drip pan strainers shall be No. 1580 Series Keil heavy duty stainless steel drip plates with three (3) (19) 3/4" wide louvers x 90% total strainer length, two (2) No. 1586-1010-1318 Keil finishing rings in each section, (25) 1" X 90 degree angle edges, and welded corners. Component Hardware is an approved equal.

Drip pan strainer shall be constructed in equal length, removable sections.

R. Electrical:

Electrical conductors shall be run in rigid conduit to a junction box on exterior of fixture and have minimum (304) 12" pigtail.

Flexible conduit shall not be used except for motor connections.

Motors shall have a flexible conduit vibration section, at least (304)12" long and not over (609) 24" long, with a ground wire running through the conduit.

Wiring in prefabricated and / or manufactured equipment shall be U.L. approved

construction by the equipment manufacturer.

Wiring in custom built equipment, areas, locations or compartments where temperature may exceed 150 degrees F. shall be of Type A1 moisture proof range and appliance lead wire with nickel conductors, with an approved insulation and braided cover.

Wiring in custom built equipment, areas, locations or compartments that will be exposed to moisture or high humidity shall be Type THW-75C machine wool wire with copper conductors and thermoplastic insulation. All internal wiring in custom- built equipment shall be terminated in one (1) junction box that is accessible for connection and service. All wiring shall be permanently marked by color coding. A permanent wiring diagram shall be attached to each piece of equipment. Conductors connected to terminals shall have T & B Sta-Kon rings.

Conductors connected together shall have Buchanan Crimp connectors including splash caps and insulators.

Conductors of multi-wire branch circuits shall have two (2) wire circuits with one (1) black and one (1) white: three (3) wire circuits with one (1) black, one (1) white and one (1) blue.

Neutral conductors shall be white.

Grounding conductors shall be green.

Electrically operated portable equipment shall have a cord and plug.

Service cords shall be Type SJO with grounding conductor securely fastened to body or frame of equipment.

Plugs shall be grounding type with service cord grounding conductor connected to grounding blade.

Receptacle grounding contacts must be clearly labeled with instructions for electrician to connect this terminal or contact to branch circuit grounding conductor.

Electric motors shall have control switches for starters.

Electric motors and electric heated equipment directly connected to the building electric system shall have a positive disconnect that will open all conductors and meet NEMA standard KS-1-1957 for Type H.D. switches.

Combination starters and disconnects installed in a single NEMA enclosure shall have the same type components as individual starters, switch, fused switches and breakers.

Starters, transformers and disconnects shall have NEMA enclosures in dry areas and watertight NEMA 4 or 5 cast enclosures in wet areas.

Each light fixture or group of light fixtures in the same system shall have No. 1251-1 Hubbell or equivalent Arrow-Hart or Pass and Seymour double pole press switch.

All equipment specified or detailed where fluorescent light fixtures are specified shall have ballasts included. All lighting fixtures furnished as part of the food service equipment contract shall include fluorescent tubes with safety coating to prevent shattering. Bulbs and tubes are to be provided and installed by the F.E.C.

Recessed receptacles and switches with pilot lights shall be stainless steel finish, Model R73-1210 and R-73-1212 by Component Hardware, or approved equal, specified with stainless steel faceplates.

Two (2) or more receptacles of the same voltage in the same equipment shall be pre-wired to a common junction box for one (1) final connection, providing total l load does not exceed 30 amps. All pre-wiring shall be done in rigid conduit with all wires color coded and tagged.

When counters are specified to be pre-wired to circuit breaker panel(s), F.E.C. shall provide 'Square D' breaker panel(s), or approved equal, sized as required to meet the equipment loads as well as local and state codes. Each panel shall be mounted within counter cabinet body behind hinged stainless steel door as located and shown on plan. Panel(s) to have individual breakers as required and main breaker; all utilities to be on separate breakers. All wires shall be tagged, numbered, color coded, run through approved conduit and located in cabinet utility chase. All breakers shall be labeled and unit shall be supplied wiring schematics. For counters requiring delivery in sections for re-assembly in field, each section of counter shall be pre-wired and wire ends supplied with snap-lock type connectors ready for reconnection in field. Providing rolls of wiring with counter is unacceptable. Counter shall be complete, ready for one (1) final connection to each circuit breaker panel by Division 16.

S. Hanger Assemblies:

Framing members for hoods, hoist or other equipment with live load of 500 pounds or weighing over 500 pounds shall be (50) 2" X (50) 2" X (6) 1/4" steel angles spaced at (914) 36" O.C. maximum.

Hangers for piping, refrigerant lines and beverage dispenser conduit shall be Power-Strut metal framing with Series PS-300 channels, Series PS-10 spring clamping nuts, (12) 1/2" diameter hanger rods, brackets, beam clamps, conduit clamps for each pipe or line and fasteners.

Horizontal runs of two or more pipes or lines shall have Power-Strut trapeze hanger and/or surface mounting assemblies spaced at 60" O.C. for lines smaller than (19) 3/4" O.D., (2133) 72" O.C. for lines (19) 3/4" to (38)1-1/2" O.D. for lines (41) 1-5/8" O.D. or larger.

Horizontal and vertical runs adjacent to building walls shall have surface mounted assemblies with same spacing and trapeze assembly.

T. Elevated Shelves:

Shelves shall be constructed of 14 gauge stainless steel, as applicable.

Shelves shall be level and plumb, under-braced same as top hereinbefore specified when exceeding (1219) 48" in length.

U. Trough / Disposer Installation:

Fit end(s) of trough with one (1) chrome plated water inlet, Component Hardware No. K36-6000, with gate valve control. Minimum connection to unit (12) 1/2". Additional water inlets shall be provided as shown on drawings and as specified in the itemized specifications.

Each sump, cone or sink with disposer mounted in bottom shall be fitted with a water inlet as specified above, located so as to direct waste into disposer with a minimum of splash.

All connections shall be made in accordance with manufacture recommendations (FEC shall show schematics on rough-in drawings).

Entire trough/sump combination shall be integral with top to give a one-piece appearance; designed to transfer waste into disposer without accumulation or restriction. Trough/sump to be provided with integral stainless steel silver-saver adjacent to disposer entrance. Silver-saver to be furnished with drain.

Furnish 14 gauge stainless steel, flush, removable disposer cover with perimeter edge turned down (12) 1/2" at sump/cone.

V. Galvanized Channel Base Frames:

12 gauge galvanized channels to be fully welded in sections with cross bracing no more than 30" on center to support equipment. Channel frames to be fitted to fabricator's equipment in shop the delivered and set in place in field by F.E.C. All sections to be bolted together fully welded and anchored to floor slab with stainless steel bolts prior to filling with concrete. Silicone all joints.

Galvanized channel frames to be filled with concrete by General Contractor.

Upon installation of equipment, F.E.C. to secure and silicone equipment base to channel frame.

W. Pass-Thru Trim:

Where pass-thru refrigerators, freezers, and/or hot food cabinets are installed through the wall, F.E.C. shall trim both sides of opening, full perimeter, with trim matching the finish of the units installed. Trim to have a continuous appearance, secured with concealed type fasteners. When units are furnished with (152) 6" high stainless steel legs, F.E.C. shall provide a removable kick plate (toe base) to match finish of units, unless otherwise specified. Trim shall be fully sealed to wall. Exposed fasteners are not acceptable.

X. Booster Heaters:

Booster heaters to be furnished complete with water pressure/temperature relief valve, water pressure regulating valve, low water protection, shock absorber, water treatment system, adjustable thermostat set to provide required supply of 185 degree hot water at dishmachine spray nozzles, and two (2) temperature/pressure indicating thermometers (one located on the incoming water line to the booster and one on the outgoing line to the dishmachine). F.E.C. shall verify all above items have been installed and in a location to provide ease of access to all controls, valves, stops etc., without moving heater and/or other equipment.

Y. Disposers:

Disposer to be furnished complete with line strainers, chrome plated vacuum breaker and flow control valves (15GPM of water flow into base of disposer; 10 GPM water flow into end of trough). Provide 14 gauge stainless steel cover plates for trough at cone or sink, and 14 gauge stainless steel control panel mounting bracket. Unit shall be located so that the body and/or legs are positioned a minimum of 2" back from the front edge of the table.

Z. Fire Protection Systems:

Provide as shown and described on contract documents.

AA. Soda / Juice Systems:

Soda / ice / juice dispensers are to be furnished by Owner's vendor or as described in contract documents.

BB. Beverage Conduit and Raceway:

Acceptable manufacturer:

a. Conduit – Kelly Bevway, HP Products, or equal

b. Raceway – Evolution Stainless Products, or equal.

All beverage raceways to be size to accept multiple beverage runs for soda, beer, and liquor.

Raceway to be constructed of #14 and #16 gauge stainless steel with removable cover.

Size and routing as per design drawings. F.E.C. is to verify all routing and coordinate with all trades as to routing of raceway and/or conduit.

All conduit to be minimum of 6" O.D. tubing. See drawings for size and material.

F.E.C. is to provide shop drawings indicating all starting and ending points with access and pull points indicated on drawing and a note as to the content of raceway or conduit shown.

Unless specified otherwise.

CC. Utility Distribution System:

Stainless steel, self-contained Utility Distribution System (UDS) of size and shape as shown on the contract drawings, and further provided as hereinafter specified under "Itemized Specifications". The system shall be completely pre-wired and pre-piped to a single connection point for electrical, gas, cold water, hot water, steam supply and condensate return as required by the food service equipment specified. All plumbing and electrical services shall include a minimum of 25% over capacity for future changes in food equipment.

Code Compliance: The UDS shall be U.L. listed under the category "Commercial Appliance Outlet Center" and manufactured in accordance with the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA), National Fire Protection Association (NFPA) pamphlet number 96 & 54, Uniform Plumbing Code (UPC), American Society of Mechanical Engineers (ASME), National Sanitation Foundation (NSF), and Occupational Safety and Health Administration (OSHA) using only U.L. listed, Bureau of Mines rated, AGA certified and CGA certified components.

DD. Owner Vendor Supplied Items:

F.E.C. to fully coordinate all Owner furnished items, verify utility requirements and indicate on shop drawings and utility rough-ins, as required.

2.04 PROCEDURES

A. Workmanship:

Entire procedure, including materials, workmanship, details, fabrication and fastening methods shall comply with applicable standards.

Workmanship and finishes shall be in accordance with best practices of the trade. Only skilled workers shall be employed in the fabrication and erection of the work of this section.

Work shall be provided complete in every detail and the finished work shall be strong, rigid, neat in appearance and free from defects as may be determined by the Owner / Project Architect and/or 3PM DESIGN.

B. Welding:

Joints in stainless steel shall be electrically welded using stainless steel electrodes. All

welds shall be free of pits and flaws. Acetylene welding or silver soldering will not be acceptable.

Joints in galvanized material shall be electrically welded using electrodes designed to weld galvanized metal. All welds shall be free of pits and flaws.

Acetylene welding will not be acceptable. Materials spot welded together shall have welds equally spaced in straight parallel or perpendicular lines. Spot welding procedure or technique is to be in strict accordance with recommendations of material and/or welding machine manufacturer.

C. Finishing:

Joints in stainless steel that have been welded shall be ground smooth and polished to a No. 4 finish. The grain shall be blended into the grain of surrounding surfaces.

Joints in galvanized material that have been welded shall be thoroughly cleaned and finished with one coat of zinc-rich paint (70% minimum). Galvanized steel shall be washed with mineral spirits, primed with Pratt and Lambert Effecto Primer or approved substitute, then spray painted with two (2) coats of Pratt and Lambert Effecto Enamel or approved substitute of color selected by 3PM DESIGN / Project Architect. Allow eight hours minimum drying time between coat of paint and primer.

Powder coated items shall have a fifteen year warranty against chipping, cracking, fading, scratching and/or damage due to temperature. Colors to be selected by Project Architect. Finish and materials to be approved for foodservice use by all governing agencies.

2.05 MATERIALS

A. Hardware:

Hardware used in the construction of custom-built equipment shall be standard product of an approved hardware manufacturer and/or as approved by 3PM DESIGN / Project Architect. Hardware shall be heavy duty chrome plated brass (walk-in door hardware shall be Kason or approved equal) or stainless steel where specified, by Component Hardware, Keil, Grant or Knape. All locks specified on equipment shall be of the same manufacturer, keyed alike unless otherwise requested by the Owner.

B. Stainless Steel Components:

Flat sheets shall be type 304 with no.3 finish, in accordance with ASTM-A-167-70 standard. Materials shall be new, of prime quality, full gauge thickness. Stainless steel shall be type 304, 18-8 series, with a content of from 17% to 19% chrome, 7% to 10% nickel and a maximum carbon content of 0.09. Exposed surface shall be interpreted to include all inside surfaces exposed to view when item is open.

Structural shapes shall be type 304 with no.3 finish on all exposed surfaces.

Hardware and fittings shall be the standard product of the manufacturer named as a standard.

Tubes shall be type 304, ornamental grade, with no. 4 finish, 16 gauge minimum, seamless drawn.

C. Galvanized Steel Components:

Flat sheets shall be type 1, class D, in accordance with FF-QQ-S-775D standard.

Structural shapes shall be galvanized by the hot dip process in accordance with ASTM-A-

123-69 standards.
Tubes shall be welded steel, structural grade, with hot dipped galvanized finish applied after fabrication.
Pipes shall be type S, grade B, schedule 40, in accordance with ASTM-A-53-69 standard.

D. Brass Components:
Flat sheets shall be 70% copper and 30% zinc alloy in accordance with ASTM B19, B36, alloy 260 half-hard finish.
Brass tops are to be B & S gauge as specified.
Structural sheets are to be B & S 18 gauge and seamless.
Brass flat surfaces and structural shapes are to have a mirror finish.
Welds are to be restored to a mirror finish and shall blend into the surface of the surrounding surfaces.

E. Copper Components:
Flat sheets shall be hard copper ASTM B152, type ETP, 48 ounces per square foot.

F. Structural Steel Shapes:
Angles, channels, rods and bars used as framing members shall be extruded shapes that are uniform in cross-section, ductile in quality and free from hard spots, runs, checks or other defects.
Structural shapes shall conform to ASTM-A-36-70 standard.
Bent or formed sheet metal will not be acceptable as a substitute for structural materials, unless prior approval in writing is obtained from 3PM DESIGN / Project Architect.
Where brakes are specified, they shall be adjustable, cam acting, side lever with positive brake shoe on the wheel tread.

G. Insulation:
Fiberglass batts shall be Johns-Manville, Owens-Corning or W.R. Grace Zonolite blanket insulation.
Plastic foam board insulation shall be Dupont urethane or approved substitute.
Insulation thickness indicated shall be foamed in place or constructed from multiple layers of board insulation of batts with staggered joints and perpendicular seams.

H. Wood:
Lumber shall be free from knots, pitchy seams or other imperfections, thoroughly air-seasoned and Kiln dried. Cover all unexposed surfaces with two coats of odorless waterproof coating.
Plywood shall be marine grade or exterior APA grade with closed grain and of thickness specified.
Exposed wood surfaces to be Birch, interiors to be Cypress, Spruce or Northern White Pine. Frame casings and jambs to be clear Douglas fir.

I. Fiberglass (FRP):
Fiberglass Reinforced Polyester (FRP) shall be molded with permanent color, minimum thickness, (3) 1/8", glass content 33% minimum, Barcol hardness at least 55, flexural strength of 30,000 PSI minimum, tensile strength 25,000 PSI. All FRP parts shall be by

manufacturer and color as selected by the Project Architect and/or Owner.
Where finished FRP parts are used in conjunction with casters or other metallic parts which impart concentrated stress at specific points, these points shall be reinforced with stainless steel battens, bars or other required shapes.
Fire ratings shall be as specified by the Project Architect.

J. Plastic Laminating:

Plastic laminated panels shall be constructed of (19) 3/4" thick marine grade plywood veneered on all exposed surfaces with plastic laminate of pattern and color as selected by Architect / Interior Designer, Seal all unexposed sides with 1/8" Masonite.
Plastic and Masonite shall be pressure laminated to plywood with mastic recommended by plastic manufacturer.
No joints shall be permitted when standard sheet size will permit panels to be constructed without joints.
Grain on upright surfaces shall run vertical. All inside corners to be sealed with approved sealer as per above.

K. Casters:

Casters on prefabricated equipment shall be the equipment manufacturer's standard product as specified under the itemized equipment list.
Casters on custom-built equipment shall be Jarvis N.S.F. non-marking polyurethane or approved substitute or as specified under itemized specifications.
Casters shall have wheel sizes indicated.
Standard duty (S.D.) casters shall be No. 5-25-111 swivel plate casters or No. 5-30-113.
Heavy duty (H.D.) casters shall be No. 5-30-113 plate casters.
Secure plate casters with four (4) (6)1/4-20 stainless steel bolts, stainless steel lock washers, and stainless steel nuts.

L. Faucets, Spray Units, and Accessories:

All faucets spray units and accessories shall be chrome plated, heavy-duty brass, equipped with removable seats and aerators, manufactured by T&S Brass or Fishers. One (1) faucet shall be provided for each sink bowl unless otherwise shown on drawings and noted in the itemized specifications.

a. Backsplash mounted faucet No. B-0230LN/062X with (304) 12” swing faucet and (12) 1/2” inlet.
b. Top or deck mounted faucet No. B-220LN/061X with (254) 10” swing spout and (12) 1/2” inlet.
c. Backsplash mounted faucet No. B-0290 with (304) 12” swing spout and (19) 3/4” inlet.
d. Backsplash mounted pre-rinse/faucet assembly No. B-2187 with (304) 12” swing spout and (12) 1/2" inlet (vegetable prep sinks).
e. Top or deck mounted faucet No. B-1120-LN/061X with 10” swing spout and (12) 1/2" inlet (servery sinks only).

All units to be complete with check valves.

a. Vertical No. B-CW1-2 with (12) 1/2” inlet.
b. Horizontal No. B-CVH1-2 with (12) 1/2” inlet.
c. Vertical No. B-CW3-4 with (19) 3/4” inlet.

d. Horizontal No. B-CVH3-4 with (19) 3/4" inlet.

Pre-rinse assembly (deck mounted) No. 03-013/BR-10 consisting of No. B-0143 pre-rinse unit modified with No. B-60C hose, No. B-0970-FE backflow preventer (for continuous pressure), No. B-0109-01 wall bracket (or No. B-0119 when required), No. BR-10 brush attachment and No. B-0512 mixing valve complete with check valves.

Pre-rinse assembly (table mounted) No. 03-013/BR-10/B-0104 consisting of No. B-0106 pre-rinse unit modified with No. B-48C hose, No. B-0104 hook outlet, No. B-0970-FE backflow preventer (for continuous pressure), No. BR-10 brush attachment and No. B-0512 mixing valve complete with check valves.

Fill faucet assembly (wall mounted) No. B-2312.

Fill faucet assembly (serving counter) No. B-101-A modified with No. 013E-84 flexible stainless steel hose, No. B-KF built-in flange and No. B-0512 mixing valve complete with check valves.

Cart washer spray unit (wall mounted) No. B-2117 complete with check valves.

Hose reel assembly No. B-1403 with 35'-0" hose (unless otherwise specified), No. B-2339-LR stainless steel control box (when specified), No. ORK4 vacuum breaker, No. B-0512 mixing valve (when specified), No. ORK2 shut-off valve (when specified) complete with check valves.

Vacuum breakers shall be mounted neatly above tabletop or backsplash as required. Provide No 3990 and 3991 with (12)1/2" inlets as manufactured by Fisher or T&S Brass.

M. Sink Drains:

Sink drains shall be a minimum of (50) 2" IPS, or as specified, complete with rear-connected overflow for each sink bowl and 4" long chrome plated tailpiece. Interconnect multiple same size drains with chrome plated continuous waste assembly, where two (2) or more drains are mounted immediately adjacent to each other.

All drains units shall be quick opening type No. DSS-8000 stainless steel rotary drain with stainless steel twist handle assembly (unless otherwise specified) with No. E50-1000 overflow assembly, as manufactured by Component Hardware. Furnish overflow assembly in accordance with sink depth as required. Approved manufacturers are T&S Brass.

Where specified furnish Component Hardware No. D34-Y011 stainless steel box pattern waste with stainless steel basket and cover for floor troughs.

N. Quick-disconnect Assemblies:

Each of the following gas hose kits shall consist of stainless steel braided hose with extruded coating, quick disconnect fitting, two (2) full flow swivel link connectors, one (1) 90 degree street elbow (when required), one (1) AGA certified gas ball valve, one (1) surelink restraining cable and all necessary hardware as manufactured by T&S Brass or Dormont.

Each of the following steam hose kits shall consist of stainless steel braided hose with extruded coating, quick disconnect fitting, two (2) full flow swivel link connectors, one (1) 90 degree street elbow (when required), one (1) steam ball valve, one (1) surelink restraining cable and all necessary hardware as manufactured by T&S Brass or Dormont.

Each of the following water hose kits shall consist of stainless steel braided hose with extruded coating, quick disconnect fitting, two (2) full flow swivel link connectors, one (1) 90 degree street elbow (when required), one (1) Surelink restraining cable and all

necessary hardware as manufactured by T&S Brass or Dormont.
Each of the following flexible coiled water hose kits are for use with coffee and tea makers and similar applications requiring smaller diameter hoses for cold water connections only not to exceed 70 degrees, as manufactured by T&S Brass or Dormont.
F.E.C. to field verify hose length required for each application to insure hose does not rest on floor and equipment can be moved for cleaning.

PART 3 - EXECUTION

3.01 UTILITIES, DELIVERY, STORAGE AND SPECIAL HANDLING

A. CM/GC shall provide and pay for the temporary power and light, openings and storage space to permit scheduled delivery of equipment. See Division 1 Section “Temporary Facilities and Controls” for further clarification.

B. The F.E.C. shall verify door openings, passages and conditions at the building. All special handling equipment charges shall be paid by the F.E.C.

C. Foodservice equipment to be delivered in factory-fabricated containers designed to protect equipment and finish until final installation. Make arrangements to receive equipment at project site, or to hold in secure warehouse until delivery can be made to job site. Coordinate all site deliveries with CM/GC.

D. Store foodservice equipment in original containers, and in location to prove adequate protection to equipment while not interfering with other construction operations.

E. Handle foodservice equipment carefully to avoid damage to component enclosures and finish. Do not install damaged foodservice equipment; return damaged components to equipment manufacturer and replace as required.

3.02 CONDITIONS AND PREPARATION

A. Verify all pertinent dimensions of the building and examine conditions affecting proper execution of this section. Evaluate access to various areas for moving in of equipment and coordinate with CM/GC.

B. Verify water pressure requirements and coordinate required reducing valve with Plumbing Contractor.

C. Inspect flooring and raised concrete bases, wall finishes; verify existence of required mechanical and electrical rough-ins; check painting, ceiling installation and all kitchen equipment.

D. Coordinate with project superintendent for the proper sequence for installation of equipment and wall finish.

E. Sweep clean all floor areas and tops of raised concrete bases before setting equipment in place; remove any spillage or foreign matter.

3.03 PLACEMENT

A. Do all fitting and fastening necessary to install fixed items or sub-items in permanent position as shown on plans.

B. Place all portable items or sub-items which do not require plumbing or electrical services as shown on plans or as directed by 3PM DESIGN / Project Architect.

3.04 ERECTION

A. Work shall be erected plumb, square and unwrapped by experienced personnel.

B. Protect all metal surfaces in contact with masonry, concrete and/or dissimilar metals with and acceptable nonabsorbent tape and/or gasket material.

C. Work shall be erected in correct horizontal and vertical alignment at the locations shown on the drawings.

D. Frames shall be anchored in place with sufficient anchorage to withstand live load with no apparent movement or tendency to fail.

E. Installation screws and fasteners shall be installed carefully to avoid scratching and/or damaging adjacent surfaces and/or fastener heads and shall be stainless steel.

F. At completion of erection work, finished surfaces shall be free of hammer and tool marks, scratches, blemishes, rust and stains.

G. Equipment shall be suitably protected, by F.E.C. during installation to prevent damage by other trades.

H. Provide general and/or seismic restraining devices in areas requiring such, as per local codes.

3.05 CLEARANCE

A. Edges of splashes on open base fixtures that are adjacent to walls shall have a 3" cleaning clearance or be sealed, seal bead not to exceed (9) 3/8", against wall.

B. Edges of splashes on closed base fixtures that are adjacent to wall or other solid fixtures higher than the splash shall form tight hairline joints. Seal joints with transparent Geoprene, General Electric or Dow silicone sealant. All excess sealant to be cleaned out to a smooth radius fillet.

3.06 FIELD JOINTS

A. Field joints in stainless steel and/or brass tops shall be welded or fused and finished as specified herein.

B. Body joints shall be draw type with hairline joints. Provide angle bracing on each side of body joint, (9) 3/8" stainless steel diameter draw bolts, lock washer and lock nuts.

3.07 UTILITY SERVICE CONNECTIONS

A. Plumbing, electrical and mechanical furnished by the F.E.C. shall be limited to that which is built-in or is an integral part of the equipment itself.

B. Final utility installation and connections shall be by related trades and is to be included in the CM/GC contracts.

C. Provide restraining devices with mobile cooking equipment as required.

3.08 CONTRACTOR COOPERATION

A. Cooperate with and render all necessary assistance to other Contractors concerned with roughing-in and final connection of utility services for this contract.

B. After final utility connections are made, thoroughly clean, sanitize, polish and inspect the proper function of all items.

C. Report malfunctioning, incomplete or missing items, Owner furnished equipment or components to 3PM DESIGN / Project Architect.

3.09 COORDINATION

A. It shall be the responsibility of F.E.C. to keep up to date with progress made in the field and installation of all necessary utility rough-ins required to accommodate all equipment specified, as shown on drawings and to make as many visits to the job site as is necessary to check and assure all rough-ins are being properly installed to accommodate this equipment.

B. F.E.C. to cooperate with all trades so that the end results of this work will be a professional, complete, approved and accepted installation. Written reports of each visit shall be sent promptly to the Project Architect and 3PM DESIGN.

C. Progress of construction is of paramount importance in execution of this project. F.E.C. is to carry out his work so that no delay in the completion of this project is incurred.

D. F.E.C. is to procure all specified equipment and coordinate installation as required by project schedule.

3.10 MODIFICATION/RESET OF EXISTING EQUIPMENT (IF REQUIRED)

A. All equipment not in the specification as "Existing/Reset" shall be modified and relocated as specified and shown on contract drawings.

B. Bidders shall carefully examine the specifications and project site including location and condition of existing equipment to determine cost for each "Existing/Reset" and "Existing/Modified" item to cover removal, modification (including materials), transportation to and from site, cleaning, inspection for damage, repair and resetting. Coordinate locations of existing equipment with owner.

C. Each "Existing/Reset" item shall be clean, in good repair and operable when reset.

3.11 RESERVATIONS AND CONDITIONS

A. It is the intent of this specification to complete the installation of all equipment covered herein in all phases ready for operation. F.E.C. shall carefully examine the plans and the specifications for building construction contracts and determine there from the extent of his operations in all respects. All labor and materials not included in building construction contracts necessary to accomplish the intent are hereby included in this contract.

B. F.E.C. shall attend first job meeting and subsequent job meetings, as required, for purpose of coordinating his work with other trades.

C. All equipment shall be received at the building fully protected. It will be the responsibility of the F.E.C. to protect the equipment until completely installed and accepted.

D. F.E.C. shall do all things and furnish all material necessary to carry out the full intent and meaning of these specifications.

E. F.E.C. is to be pro-active in their involvement with the project, shall monitor work in progress and coordinate their work as required to meet all schedule dates.

3.12 ACCEPTANCE

A. 3PM DESIGN will inspect the completed work connected with this section for compliance to the Contract Documents, upon notification by the Owner, Project Architect or F.E.C. whichever occurs first.

B. Prior to acceptance of the work of this Section, F.E.C. shall clean, sanitize, polish and treat all stainless steel, cast iron, enamel porcelain and other type surfaces in accordance with manufacturer's recommendations and/or procedures.

C. Prior to acceptance of this Section, F.E.C shall clean and retouch al painted surfaces, powder-coated surfaces that have been damaged must be re-finished by an established powder-coating firm.

3.13 TESTING, DEMONSTRATING AND INSTRUCTING

A. NOTE: In addition to the stipulated retainage of payment as required, the Owner shall retain an additional (10%) ten percent of the line item applicable to "Food Service Equipment" as listed in the Contractor's Schedule of Values. This additional retainage will be released only after the requirements of this section of these specifications are met and the appropriate forms under Section 11400-5 are completed and approved in their entirety to the complete satisfaction of the Consultant and Owner's Project Manager.

B. F.E.C. shall at the completion of this work remove all debris, crating, packaging materials and implements associated with this work leaving the area broom clean.

C. F.E.C. shall provide and maintain protective covering for finished surfaces and other parts of

equipment and/or cooler/freezer assemblies subject to damage during and after installation.

D. Clean, test, adjust, calibrate by a factory authorized service agency all foodservice equipment and fixtures to make ready for operation when the facility is turned over to the Owner.

E. After the above is complete, all items furnished under this Contract shall be operated and thoroughly tested to insure proper safe operation. The Owner, the FoodService Consultant, and the CM/GC shall be notified of this testing and is to be provided with a copy of the service agencies' report.

F. When the food service equipment has been cleaned and tested and is operating properly, the F.E.C. shall arrange to have equipment furnished under this section of the contract demonstrated, pursuant to the availability of the Owner and it's representatives, by an authorized representatives who are to instruct the Owner's designated personnel in the use, care and maintenance of the equipment. NOTE: Attendance at the demonstration meeting is required of all manufacturers' designated representatives providing equipment under this Contract and is to occur at one meeting.

G. The F.E.C. shall be responsible for scheduling the demonstration meeting. Each manufacturer's representative shall be present at this meeting:

Demonstrate to and instruct the Owner's designated personnel as to the operation, use, care, cleaning and maintenance of all items of equipment and respond to all questions and concerns by written response.

Provide the Owner's designated representative with the name, address and telephone number of a designee of each manufacturer and state which designee shall be responsible to quickly respond to warranty work 24 hours a day, 365 days a year. This is to be direct contact. The Owner may contact such warranty representatives designee directly, and such designee may respond without voiding any responsibility or warranties of the manufacturer, the F.E.C., and the CM/GC. Service charges for this warranty representative, no matter what the resolution of the problem may be, shall be the responsibility of the manufacturer, the F.E.C., and the G.C. In any event, the F.E.C. shall be responsible to immediately pay upon invoice, charges by the warranty representative in order to keep the warranty representative responsive. Whether the plumbing, electrical, food service equipment or other sub-contractors (or even the Owner) should be back charged will be resolved later.

Provide the Owner's representative with six (6) sets of operation maintenance manuals for each item of equipment furnished under this contract. This set shall be neatly bound in a three-ring binder, by F.E.C. with the delivery of this booklet receipted at the time of delivery.

Attendance at the one demonstration meeting is required of all manufacturers representatives providing equipment under this contract, if for any reason an additional meeting must be scheduled the F.E.C. will be responsible for all additional fees and costs incurred.

3.14 CORRECTION OF DEFECTS, SERVICES, GUARANTEE AND RESPONSIBILITIES

A. General:

F.E.C. shall replace, at the Owner's, 3PM DESIGN's and/or the Project Architect's

discretion, or make satisfactory repairs to any item of equipment that fails to conform to the requirements of the Contract at the time and shall remedy any defects due to faulty materials or workmanship which appear within a period of one (1) year from start-up and demonstration of equipment.

Items shall be tested and adjusted by skilled mechanics and this Contractor shall guarantee the material and workmanship of the equipment furnished by him under these specifications, for a period of one (1) year after acceptance by Owner.

All equipment, refrigeration systems and ice makers shall have start-up and a two (2) year extended service warranty for parts and labor and five (5) year extended warranty on compressors which will start on the date of Owner's acceptance. All additional warranties as noted in the itemized specification shall be factory purchased warranties for each item; proof of warranties shall be provided. The cost of all warranties shall be included in the bid proposal and contract sum and shall serve as a prepaid service contract.

Contractors who do not normally maintain local refrigeration service personnel shall be required to provide the Owner with a refrigeration service policy in writing from local refrigeration service company that maintains a twenty-four (24) hour call service and that is acceptable to the Owner for a period of one (1) year at no additional expense to the Owner

Provide to Owner a listing of factory authorized service agencies and copies of written service and warranty agreements on all items of equipment provided under this contract, excluding Owner furnished and/or existing items.

Service contracts on refrigeration systems must be contracted for by the F.E.C. with authorized local service organizations capable of providing prompt and efficient service. Submit six copies of all service contracts, as specified herein, upon completion of the installation of the equipment to the Owner.

3.15 EXAMINATION OF PLANS AND SPECIFICATIONS

A. Plans and specifications are furnished for the use of the F.E.C. in preparing an itemized cost estimate and indicate the design intent of 3PM DESIGN.

B. It is the responsibility of the F.E.C. to examine all documents, which include the contract drawings and specifications, to ensure there are no typographical errors, discrepancies in quantities, drafting errors, utility information, manufacturer and model numbers, options, etc. which would affect the outcome of a complete and professional bid. Should a model number no longer be available and/or has been replaced, the latest model shall be provided. All discrepancies and verification requests shall be brought to the attention of 3PM DESIGN / Project Architect (PA) prior to the submittal of the bid, and are to be addressed in the form of a written RFI to 3PM DESIGN with a copy to the PA for interpretation. In the case these discrepancies and verifications are not brought to the attention of 3PM DESIGN / Project Architect prior to the submittal of the bid, the F.E.C. will be fully responsible to furnish and provide the equipment as represented by 3PM DESIGN, within reason, at no additional cost to the Owner.

3.16 MISCELLANEOUS REQUIREMENTS

A. Uniform Quality:

Custom built items must be constructed by the same fabricator to insure uniform quality and appearance.
Similar type items of manufacture and/or prefabricated equipment must be the product of the same manufacturer.

B. Identification Plates:

Each piece of equipment must have a suitable nameplate supplied by the manufacturer that is to include the name of the manufacturer, the electrical and/or utility demands.
Each switch and/or control device shall have an approved nameplate indicating its function or purpose such as display shelf lights, frost plate compressor and plate warmer.
Indicator dials and other standard components of prefabricated equipment will be considered acceptable identification of their physical location clearly indicating the warmers and/or other equipment items that they control.
All nameplates must be non-corrosive metal with engraved letters or have acid etched, phenolic and / or painted letters.

C. Foodservice Equipment Notes:

In each item of equipment hereinafter specified under the 'Itemized Specifications', these specifications shall identify each respective item by name, model number, accessories, required utilities, brochure data sheets, as well as list various component parts and warranty requirements provided for same.
These items and their component parts shall be of material (mounted where applicable) constructed and furnished in strict accordance to that described in the General Specifications for these items and integrally constructed where applicable. It shall be intended that where buy-out (prefabricated) items are specified, same shall be definitely furnished with all the accessories as normally furnished by manufacturer for these items. Also in strict accordance with current manufacturer's engineering data sheet for each respective item.
All cooking equipment shall have stainless steel exterior (unless otherwise specified).
All gas fired equipment to have rear gas connects where applicable.
Provide POSI-SET devices at all rear casters of mobile cooking line equipment located below exhaust hoods.

ITEM #1: DISHTABLE SOILED

Quantity: One (1)
Type: Custom
Model No.: 'L' Shape Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 21" x 21" x 7" deep sink to except Item 2 Disposer.
2. Milk trough and quick drain.

ITEM #2: DISPOSER, GARBAGE

Quantity: One (1)
Type: Insink Erator
Model No.: SS-200-7-AC101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (1) Fisher 2210-WB splash mounted Pre-rinse.

ITEM #3: WAREWASH, RACK CONVEYOR

Quantity: One (1)
Type: Hobart
Model No.: CL44e-E-LR
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with limit switch.
2. Water tempering kit.
3. Water hammer arrestor.
4. Electric tank heat.

ITEM #4: BOOSTER HEATER, ELECTRIC

Quantity: One (1)
Type: Hatco
Model No.: S-30
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Shock absorber.
2. Back pressure relief valve.
3. Stainless steel legs.

ITEM #5: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate

Model No.: WS-12-72
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #6: DISHTABLE, STRAIGHT

Quantity: One (1)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Under shelf to right of Item 4 Booster Heater.

ITEM #7: SHELVING WIRE

Quantity: Two (2)
Type: Nexel
Model No.: S2142Z
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #8: HOOD, CONDENSATE

Quantity: One (1)
Type: Custom
Model No.: Fabricated 48”Deep x 60” long
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #9: POT WASHER

Quantity: One (1)

Type: Hobart
Model No.: UW50 Build-up
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. UW50 energy star electric heat, electric rinse water heater, vent fan control, powered vent fan control.
2. Drain water tempering kit.
3. Water hammer arrestor kit.
4. Built-in 14 KW Booster Heater

ITEM #10: SOILED DISHTABLE, RIGHT HANDED

Quantity: One (1)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 21” x 21” x 7” deep sink to except Item 14 Disposer.
2. Provide scupper overflow trough between sink and disposer.

ITEM #11: SPARE NUMBER

ITEM #12: SPARE NUMBER

ITEM #13: SINK, HAND, WALL MOUNT

Quantity: Seven (7)
Type: Eagle Group
Model No.: HSAN-10-F
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Splash mounted gooseneck faucet and aerator, wrist handles.
2. Basket drain.
3. Soap & Towel dispenser by Owner

ITEM #14: DISPOSER, GARBAGE

Quantity: One (1)
Type: Insink Erator
Model No.: SS-150-18C-AS101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Fisher 2210-WB splash mount Pre-rinse unit.

ITEM #15: POWER WASH SINK

Quantity: One (1)
Type: Power Soak
Model No.: 200PSD-150L
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (2) 20” x 28.75” x 14” and (1) 48” x 28.75” x 14” deep sinks with rotary drains.
2. (1) One splash mounted pre-rinse unit and (1) One splash mounted faucet.
3. Provide with undershelf under right drainboard..
4. Scupper overflow trough.
5. Sheet pan system.

ITEM #16: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: WS-12-120
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #17: SPARE NUMBER

ITEM #18: SPARE NUMBER

ITEM #19: SPARE NUMBER

ITEM 20: SPRAY-SYSTEM, WALL MOUNT

Quantity: One (1)
Type: Spray Master
Model No.: SMT-600W
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 50’ High pressure hose.
2. SMT-Trapshoot
3. SMT-Wallbrush
4. SMT-Hummerjetr

ITEM #21: CHILLER/FREEZER, REACH-IN BLAST

Quantity: One (1)
Type: Thermo-Kool
Model No.: TK20-2
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (1) food probe; stainless steel interior shelves; casters.
2. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #22: 60 QUART MIXER

Quantity: One (1)
Type: Hobart
Model No.: HL600-1STDDEL
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Standard attachments.

ITEM #23: FLAT TOP, WORKTABLE, UNDERSHELF

Quantity: One (1)
Type: Eagle Group or Alternate
Model No.: T3072STB-BS

SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Open below for Item 25 Ingredient Bins.

ITEM #24: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: WS-12-108
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #25: BIN, INGREDIENT

Quantity: Four (4)
Type: Cambro
Model No.: IBSF27
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #26: 20 QUART MIXER

Quantity: One (1)
Type: Hobart
Model No.: HL200-1STDDEL
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #27: STAND, TABLE

Type: Advance Tabco or Equal
Model No.: MT-SS-300
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Casters with brakes.

ITEM #28: SPARE NUMBER

ITEM #29: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: WS-1248
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator

ITEM #30: SINK, TWO COMPARTMENT

Quantity: Three (3)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 30” deep with raised marine edge.
2. (2) 18” x 21” x 12” deep sinks with Rotary drains and splash mounted faucet.
3. Provide undercounter shelf under left drainboard.
4. Scupper separation trough.

ITEM #31: DISPOSER, GARBAGE

Quantity: One (1)
Type: Insink Erator
Model No.: SS-150-15C-AC101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Fisher 2210-WB splash mounted pre-rinse faucet.

ITEM #32: SPARE NUMBER

ITEM #33: SHELF, WALL MOUNT

Quantity: Two (2)
Type: Advance Tabco or Alternate
Model No.: WS-12-60
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #34: TABLE WORK, W/ UNDERSHELF

Quantity: Two (2)
Type: Eagle Group or Equal
Model No.: T2472STB-L-1
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Full undershelf.

ITEM #35: POT RACK, CEILING MOUNTED

Quantity: Two (2)
Type: Eagle Group
Model No.: CM72PR
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Stainless steel double prong pot hooks, 6” O.C.

ITEM #36: SPARE NUMBER

ITEM #37: SPARE NUMBER

ITEM #38: DISPOSER, GARBAGE

Quantity: One (1)
Type: Insink Erator
Model No.: SS-150-15C-AS101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (1) Fisher 2210-WB splash mounted pre-rinse.

ITEM #39: SLICER/VEGETABLE

Quantity: One (1)
Type: Piper
Model No.: GSM5 Star
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #40: DISPOSER, GARBAGE

Quantity: One (1)
Type: Insink Erator
Model No.: SS-150-15C-AS101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (1) Fisher 2210-WB splash mounted pre-rinse.

ITEM #41: SPARE NUMBER

ITEM #42: SPARE NUMBER

ITEM #43: COMBI OVEN, STEAMER

Quantity: One (1)
Type: Blodgett
Model No.: BC-20G
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. EV9797-21 Kleen Steam 2 Water filter system.
2. Verify altitude and type of gas.
3. Gas pressure regulating valve with built-in vent limiting device.
4. Factory gas interconnection.
7. Core temperature probe.
8. One (1) Dormont #1675KIT2S-48 or T&S #HG-4D-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing Division's use in installing the hose components.

ITEM #44: TILT, SKILLET

Quantity: One (1)
Type: MARKET FORGE
Model No.: 40P-STGL
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Tilting Skillet, Gas, 40-gallon capacity, Type 316 stainless steel liner, includes spring-assisted hinged cover, kettle markings and electronic spark ignition, food strainer, s/s level adjustable feet
2. 1 ea. One year limited warranty, standard
   1 ea. Gas type to be specified
   1 ea. Double Pantry Faucet.
   1ea. Pan Support
   1ea. 2” diameter tangent draw-off valve with strainer
   1ea. Pouring lip strainer
   1ea. Spring-assisted Cover
3. Verify altitude and type of gas.
4. Gas pressure regulating valve with built-in vent limiting device.
5. One (1) Dormont #16100KIT2S-48 or T&S #HG-4E-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing division's use in installing the hose components.

ITEM #45: S/S FLOOR BASE W/ FLOOR TROUGH

Quantity: One (1)
Type: Custom

Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 12 Gauge stainless steel anti-spill floor covering, length and width per plan ending with 24" wide x 6" deep floor trough, removable bar non slip grates and raised front lip edge.
2. See drawing detail.

ITEM #46: KETTLE, STEAM JACKETED, TILTING

Quantity: One (1)
Type: Market Forge
Model No.: FT-80L (Direct Steam)
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Tilting Kettle, Gas, 80-gallon capacity, Type 316 stainless steel liner, includes spring-assisted hinged cover, kettle markings and electronic spark ignition, food strainer, s/s level adjustable feet
2. 1 ea. One year limited warranty, standard
   1 ea. CKT-1 steam control kit.
   1 ea. Hot and cold water faucet with swing spout.
   1ea. Kettle Markings
   1ea. Double pantry Faucet
   1ea. 3" diameter tangent draw-off valve with strainer
   1ea. 3" Diameter Butterfly Valve
   1 ea. Hinged stainless steel cover.
   1 ea. Etch marks, 5 gallon increments.
   1 ea. PRV- pressure reducing valve.
   1 ea. Brush set.

ITEM #47: STEAMER CONVECTION, GAS

Quantity: One (1)
Type: Market Forge
Model No.: 3500M36G300A
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify altitude and type of gas.
2. Gas pressure regulating valve with built-in vent limiting device.
3. One (1) Dormont #16100KIT2S-48 or T&S #HG-4E-SK-48 commercial use A.G.A. and N.S.F. Ap-

proved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing division's use in installing the hose components.

4. Water filter system.
5. Steam take off kit to power Item 46 direct steam kettle.

ITEM #48: OVEN, CONVECTION, GAS

Quantity: Five (5)
Type: Blodgett Oven
Model No.: DFG-100 Double
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify altitude and type of gas.
2. Gas pressure regulating valve with built-in vent limiting device.
3. Factory gas interconnection.
4. 4” Heavy-duty casters, front with brakes.
5. Solid state digital control, cook and hold and pulse plus.
6. One (1) Dormont #1675KIT2S-48 or T&S #HG-4D-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing Division's use in installing the hose components.

ITEM #49: EXHAUST HOOD (BY MECHANICAL ENGINEER)

Quantity: One (1)

ITEM #50: FIRE SUPPRESSION SYSTEM (BY MECHANICAL ENGINEER)

Quantity: Two (2)

ITEM #51: Crisper, Ventless, Electric

Quantity: Two (2)
Type: Quick n Crispy
Model No.: GF5
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #52: STAND, TABLE

Quantity: One (1)
Type: Eagle Group
Model No.: T3036E-CA
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 6” Heavy-duty casters, front with brakes.

ITEM #53: SPARE NUMBER

ITEM #54: 36” RANGE – 4 BURNERS

Quantity: One (1)
Type: Vulcan
Model No.: V4B36S
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify altitude and type of gas.
2. Gas pressure regulating valve with built-in vent limiting device.
3. Factory gas interconnection.
4. One (1) Dormont #1675KIT2S-48 or T&S #HG-4D-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing Division's use in installing the hose components.

ITEM #55: EXHAUST HOOD (BY MECHANICAL ENGINEER)

Quantity: One (1)

ITEM #56: MICROWAVE/CONVECTION OVEN

Quantity: Two (2)

Type: Turbochef
Model No.: Tornado 2
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #57: SPARE NUMBER

ITEM #58: REFRIGERATOR, REACH-IN, PASS-THRU

Quantity: Two (2)
Type: Beverage-Air
Model No.: PRD48
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Provide heavy-duty swivel casters with brakes.

ITEM #59: TABLE, WORK W/ UNDERSHELF

Quantity: One (1)
Type: Eagle Group or Alternate
Model No.: T2460STE
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with undershelf.

ITEM #60: STAINLESS STEEL WALL FLASHING

Quantity: One (1)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Stainless steel flashing to cover wall behind and adjacent to the cooking equipment, from the finished floor to the bottom of the exhaust hood, the length and width of the exhaust hood.

Provide trim strips and batten strips as required.
2. Refer to detail 17-R2.

ITEM #61: SPARE NUMBER

ITEM #62: PREP TABLE WITH SINK

Quantity: One (1)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 18” x 18” x 10” deep sink with Rotary drain and splash mounted faucet.
2. Provide full undershelf.

ITEM #63: POT RACK, CEILING MOUNTED

Quantity: One (1)
Type: Eagle Group
Model No.: CM60PR
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide stainless steel double prong hooks, 6” O.C.

ITEM #64: CUTTER/MIXER, VERTICAL

Quantity: One (1)
Type: Hobart
Model No.: HCM450+Build-up
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Cut knife and strainer basket.

ITEM #65: SLICER

Quantity: One (1)
Type: Hobart
Model No.: 2712
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #66: SLICER STAND

Quantity: One (1)
Type: Eagle Group or Alternate
Model No.: T3030SEM-ST
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 5” Casters, two with brakes.

ITEM #67: SPARE NUMBER

ITEM #68: DISPOSER, GARBAGE

Quantity: One (1)
Type: In sink erator
Model No.: SS-150-18C-CC101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Fisher 2210-WB pre-rinse faucet.

ITEM #69: SPARE NUMBER

ITEM #70: TABLE, WORK

Quantity: One (1)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide undercounter shelf under right drainboard.
2. Scupper separation trough.
3. Splash mounted faucet.
1. 18” x 18” x 12” deep sink with rotary drain.

ITEM #71: SPARE NUMBER

ITEM #72: SPARE NUMBER

ITEM #73: SPARE NUMBER

ITEM #74: CABINET, WARMING & HOLDING

Quantity: Ten (10)
Type: Cres-Cor
Model No.: H-137-SUA-12D
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. 5” diameter heavy duty casters, (2) with brakes.
3. Corner bumpers.

ITEM #75: SPARE NUMBER

ITEM #76: WALK-IN FREEZER

Quantity: One (1)
Type: ThermalRite
Model No.: Pre-fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Walk-in cooler to be prefabricated of modular design and construction.
2. Panels to be interchangeable, with U.L. Labeled, CFC free urethane insulation sandwiched be-

tween interior and exterior metal surfaces, with an overall thickness of 4 inches. Edges of panels to be high-density urethane "tongue and groove", with cam-lock assemblies, set-in-place at time of fabrication. The access ports are to be on the interior, for inside assembly of the walk-in, and shall be covered with "snap caps". Interior and exterior finishes are to be manufacturer's standard gage stucco embossed aluminum. 8” floor depression specified by Architect and installed by General Contractor. Walk-in Floors to be aligned with kitchen floor. No wood will be permitted in any panels or doors.

3. One (1) 34" x 78" entrance door and frames. Doors to have three (3) hinges as shown on plans. The doors are to be flush type, constructed and insulated in the same manner as the wall panels, and finished inside and out, to match adjacent walls. Doors and door sections to be equipped with the following:

a. Magnetic gasket, hydraulic piston driven door closer and cam lift hinges. Hardware to have provisions for locking and a safety release to prevent entrapment of personnel within the box.

b. Provide each entrance door section with an incandescent type vapor-proof light with clear globe and heavy-duty 100-watt clear bulb to provide 50’ candles , pilot light switch and conduit between switch box and outlet box. All conduit and wiring to be concealed, where possible.

c. Entrance door(s) in exterior walls of cooler to have vinyl strip curtains.

d. Unheated pressure relief ports air-vent in cooler compartment.

e. Audio-visual alarm for each compartment, to be included in door section, with remote sensor and adjustable alarm points to indicate the temperature inside, and sound an alarm when the temperature is unsatisfactory. The alarm shall have a mute switch to silence the audible alarm and a reset button to reset the alarm once the temperature conditions are satisfactory.

f. Provide doors with insulated view ports (12x12)

4. (Lot) LED light fixtures, with protective covers, for field installation by the Electrical Division. All light fixtures to be U.L. Listed for use inside walk-in cooler (50 foot candle). All conduit and wiring is to be concealed, where possible.

5. Matching finish trim strips, from floor to ceiling, at all exposed vertical edges, corners, and joints to building walls. Contractor to verify dimensions.

6. Matching finish closure panels from top of walk-in to finished ceiling, on exposed sides.

7. Unit and all components to be N.S.F. Approved, U.L. Labeled and U.L. Classified with a flame spread of 25 or less, and meet the April 1, 1998 requirements of N.S.F. Standard #7.

8. For any installation requiring additional ceiling support, provide self-supporting ceiling structural framework over the top of the walk-in compartments, and supported by the walk-in walls.

9. Verify all dimensions with building conditions for proper fit. Provide maximum size possible to fit available space, using standard panels.

ITEM #77: COOLER, WALK-IN

Quantity: One (1)
Type: ThermalRite
Model No.: Pre-Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Walk-in cooler to be prefabricated of modular design and construction.

2. Panels to be interchangeable, with U.L. Labeled, CFC free urethane insulation sandwiched between interior and exterior metal surfaces, with an overall thickness of 4 inches. Edges of panels to be high-density urethane "tongue and groove", with cam-lock assemblies, set-in-place at time of fabrication. The access ports are to be on the interior, for inside assembly of the walk-in, and shall be covered with "snap caps". Interior and exterior finishes are to be manufacturer's standard gage stucco embossed aluminum. No wood will be permitted in any panels or doors.
3. One (1) 34" x 78" entrance door and frames. Doors to be hinged as shown on plans with, (three) 3-hinges. The doors are to be flush type, constructed and insulated in the same manner as the wall panels, and finished inside and out, to match adjacent walls. Doors and door sections to be equipped with the following:

a. Magnetic gasket, hydraulic piston driven door closer and cam lift hinges. Hardware to have provisions for locking and a safety release to prevent entrapment of personnel within the box.
b. Provide each entrance door section with an incandescent type vapor-proof light with clear globe and heavy-duty 100-watt clear bulb to provide 50’ candles , pilot light switch and conduit between switch box and outlet box. All conduit and wiring to be concealed, where possible.
c. Entrance door(s) in exterior walls of cooler to have vinyl strip curtains.
d. Unheated pressure relief ports air-vent in cooler compartment.
e. Audio-visual alarm for each compartment, to be included in door section, with remote sensor and adjustable alarm points to indicate the temperature inside, and sound an alarm when the temperature is unsatisfactory. The alarm shall have a mute switch to silence the audible alarm and a reset button to reset the alarm once the temperature conditions are satisfactory.
f. Provide doors with insulated view ports (12x12)

4. (Lot) LED light fixtures, with heavy-duty protective covers, for field installation by the Electrical Division. All light fixtures to be U.L. Listed for use inside walk-in cooler (50 foot candle). All conduit and wiring is to be concealed, where possible.
5. Matching finish trim strips, from floor to ceiling, at all exposed vertical edges, corners, and joints to building walls. Contractor to verify dimensions.
6. Matching finish closure panels from top of walk-in to finished ceiling, on exposed sides.
7. Unit and all components to be N.S.F. Approved, U.L. Labeled and U.L. Classified with a flame spread of 25 or less, and meet the April 1, 1998 requirements of N.S.F. Standard #7.
8. For any installation requiring additional ceiling support, provide self-supporting ceiling structural framework over the top of the walk-in compartments, and supported by the walk-in walls.
9. Verify all dimensions with building conditions for proper fit. Provide maximum size possible to fit available space, using standard panels.

ITEM #78: AIR CURTAIN

Quantity: One (1)
Type: Mars Air System
Model No.: LPV60-1E
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #79: FREEZER COMPRESSOR

Quantity: One (1)
Type: Thermal Rite / Heatcraft
Model No.: MOZ045L63C
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. One (1) pre-assembled, hermetic, remote, air-cooled, cooler compartment refrigeration system. System to consist of condensing unit high side assembly and low profile evaporator coil low side assembly, evaporator mounting kit, thermostatic expansion valve, pump-down cycle kit, solenoid valve, temperature control, sight glass, drier, vibration eliminator, pressure control, crankcase heater, extreme low ambient controls, weatherproof housing, and any accessories necessary for a completely installed and functional system for a cooler box temp of -10 to -5 degrees F. Verify exact installation location with Architect, architectural plans, and site conditions.
2. Contractor’s certified refrigeration mechanic to install all components supplied with the compressor, as per manufacturer's instructions. Also furnish and install refrigeration lines, insulation, refrigerant and accessories as per manufacturer's instruction's and as required.

ITEM #80: COOLER COMPRESSOR

Quantity: One (1)
Type: Thermal Rite
Model No.: MOH009X62CFMT
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. One (1) pre-assembled, hermetic, remote, air-cooled, cooler compartment refrigeration system. System to consist of condensing unit high side assembly and low profile evaporator coil low side assembly, evaporator mounting kit, thermostatic expansion valve, pump-down cycle kit, solenoid valve, temperature control, sight glass, drier, vibration eliminator, pressure control, crankcase heater, extreme low ambient controls, weatherproof housing, and any accessories necessary for a completely installed and functional system for a cooler box temp of +35 to + 40 degrees F. Verify exact installation location with Architect, architectural plans, and site conditions.
2. Contractor’s certified refrigeration mechanic to install all components supplied with the compressor, as per manufacturer's instructions. Also furnish and install refrigeration lines, insulation, refrigerant and accessories as per manufacturer's instruction's and as required.

ITEM #81: SPARE NUMBER

ITEM #82: SPARE NUMBER

ITEM #83: RACK, TRAY

Quantity: One (1)
Type: Channel
Model No.: 401A
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Pan stops.
2. Provide heavy duty casters.

ITEM #84: SPARE NUMBER

ITEM #85: SPARE NUMBER

ITEM #86: SHELVING, WIRE

Quantity: One (1-LOT)
Type: Nexel
Model No.: PM21488N
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #87: SPARE NUMBER

ITEM #88: SPARE NUMBER

ITEM #89: SHELVING, WIRE

Quantity: (1-LOT)
Type: Nexel
Model No.: PM21368N
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #90: RACK, TRAY

Quantity: Two (2)
Type: Channel Manufacturing
Model No.: 401A
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Pan stops.
2. Provide heavy duty casters.

ITEM #91: SPARE NUMBER

ITEM #92: SPARE NUMBER

ITEM #93: RACK, CAN

Quantity: Three (3)
Type: Advance Tabco
Model No.: CR10-162-X
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #94: SHELVING, WIRE

Quantity: Sixteen (16)
Type: Nexel
Model No.: S1848EP
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #95: RACK, DUNNAGE

Quantity: Eight (8)
Type: Cambro
Model No.: DRS36-131
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Dunnage to hold 1000 pounds.

ITEM #96: BIN, ICE

Quantity: One (7)
Type: Scotsman
Model No.: C0322MW-1
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #97: ICE MAKER, CUBER

Quantity: One (7)
Type: Scotsman
Model No.: B322S
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with water filter system
2. Heavy duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division

ITEM #98: SPARE NUMBER

ITEM #99: CABINET,MOBILE, WARMING & HOLDING (PASS-THRU)

Quantity: One (7)
Type: Cres-Cor
Model No.: H-137-PSUA-12D
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. 5” diameter heavy duty casters, (2) with brakes.
3. Corner bumpers.

ITEM #100: CABINET, HOT, HOLDING

Quantity: One (1)
Type: Cres-Cor
Model No.: H-137-SUA-12D
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. 5” diameter heavy duty casters, (2) with brakes.
3. Corner bumpers.

ITEM #101: REFRIGERATOR, REACH-IN

Quantity: One (1)
Type: Beverage-Air
Model No.: HRP2-S
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Provide heavy-duty swivel casters with brakes.

ITEM #102: SHELVING WIRE

Quantity: Two (2)
Type: Nexel
Model No.: S2142Z
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #103: BUFFET FLAT TABLE

Quantity: Three (3)
Type: Duke Manufacturing
Model No.: TST-60SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters with brakes.
2. Stainless steel top and body.
3. Open shelves below.
4. Line up locks.
5. Two units with Item 115 and 116 Sneeze Guard as part of unit. Refer to plan for length. One unit without sneeze guard.

ITEM #104: BUFFET/ CAFETERIA, HOT FOOD STATION

Quantity: One (1)
Type: Duke Manufacturing
Model No.: TEHF-60SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters.
2. Stainless steel top and body.
3. Open shelf below.
4. Manifold drains to one ball valve.
5. Line up locks.
6. Heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
7. Hole grommet in bottom shelf for drain pipe.
8. Install Item 114 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #105: BUFFET/ CAFETERIA, HOT FOOD STATION

Quantity: One (1)
Type: Duke Manufacturing
Model No.: TEHF-74SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters.
2. Stainless steel top and body.
3. Open shelf below.
4. Manifold drains to one ball valve.
5. Line up locks.
6. Heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
7. Hole grommet in bottom shelf for drain pipe.
8. Install Item 114 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #106: CABINET, HOLDING

Quantity: One (1)
Type: Cres Cor
Model No.: H-147-SUA-5D
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Heavy-duty casters, (2) with brakes.

ITEM #107: BUFFET FLAT TABLE

Quantity: One (1)
Type: Duke Manufacturing
Model No.: TST-48SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters with brakes.
2. Stainless steel top and body.
3. Open shelves below.
4. Line up locks.
5. Install Item 115 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #108: BUFFET FLAT TABLE

Quantity: One (1)
Type: Duke Manufacturing

Model No.: TST-42SS (Modified to 42” long x 24” deep)
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters with brakes.
2. Stainless steel top and body.
3. Open shelves below.
4. Line up locks.
5. Install Item 115 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #109: HEATED SHELF

Quantity: One (1)
Type: Hatco
Model No.: GR2S-48
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #110: BUFFET/ CAFETERIA, HOT FOOD STATION

Quantity: Two (2)
Type: Duke Manufacturing
Model No.: TEHF-46SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters.
2. Stainless steel top and body.
3. Open shelf below.
4. Manifold drains to one ball valve.
5. Line up locks.
6. Heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
7. Hole grommet in bottom shelf for drain pipe.
8. Install Item 115 and 116 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #111: DISPLAY CASE, HEATED

Quantity: One (1)
Type: Hatco
Model No.: FSCD-2PD
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #112: BUFFET FLAT TOP TABLE

Quantity: Two (2)
Type: Duke Manufacturing
Model No.: TST-74SS
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters with brakes.
2. Stainless steel top and body.
3. Open below for Item 106 Warming Cabinet, remainder open shelving.
4. Line up locks.
5. Install Item 115 Sneeze Guard as part of unit. Refer to plan for length.

ITEM #113: REFRIGERATOR, SANDWICH/SALAD PREP

Quantity: Two (2)
Type: Beverage-Air
Model No.: SP60-16
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Heavy duty casters with brakes.

ITEM #114: SNEEZE GUARD, FULL SERVE/SELF SERVE

Quantity: Three (3) Lot
Type: English
Model No.: AMA-100

SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 1/4 " tempered front and end glass.
2. 1" diameter stainless steel tubular posts.

ITEM #115: SNEEZE GUARD, FULL SERVE/SELF SERVE

Quantity: Four (4) Lot
Type: English
Model No.: AMA-100
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 1/4 " tempered front and end glass.
2. 1" diameter stainless steel tubular posts.

ITEM #116: SNEEZE GUARD, FULL SERVE/SELF SERVE

Quantity: Four (4) Lot
Type: English
Model No.: AMA-100
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 1/4 " tempered front and end glass.
2. 1" diameter stainless steel tubular posts.

ITEM #117: TRAY SLIDE

Quantity: Three (3)
Type: Custom Fabricated
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Cover wall below, see tray slide detail 17.
2. Shape and size per plan.

ITEM #118: BUFFET/ CAFETERIA, COLD FOOD STATION

Quantity: Three (3)
Type: Duke Manufacturing
Model No.: TCM-60
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters.
2. Verify color and finish with District.
3. TSS-XP Enclosed cabinet panels with louvered panel at compressor. Verify color with Architect.
4. Heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
5. Hole grommet f in bottom shelf for drain pipe.
6. Install Item 119 Sneeze Guard as part of unit.
7. Solid stainless steel tray slide, both sides.
8. Stainless steel kickplates.

ITEM #119: BUFFET/CAFETERIA, COUNTER PROTECTOR

Quantity: Four (4)
Type: English
Model No.: AMA-101AV/101V-4 (Island)
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. 1/4 “ tempered front and end glass.
2. 1” diameter stainless steel tubular posts.

ITEM #120: BUFFET/ CAFETERIA, COLD FOOD STATION

Quantity: One (1)
Type: Duke Manufacturing
Model No.: TCM-88
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Counter is mounted on 5” diameter, ball bearing and swivel type casters to be non-marking lockable casters.
2. Verify color and finish with District.
3. TSS-XP-Enclosed cabinet panels with louvered panel at compressor. Verify color with Architect.
4. Heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

5. Hole grommet f in bottom shelf for drain pipe.
6. Install Item 119 Sneeze Guard as part of unit.
7. Solid stainless steel tray slide, both sides.
8. Stainless steel kickplates.

ITEM #121: TRAY SLIDE

Quantity: Four (4)
Type: Duke Manufacturing
Model No.: TSSOLID-HD/FX
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Part of Items 118 and 120 Cold Food Stations.

ITEM #122: SPARE NUMBER

ITEM #123: SPARE NUMBER

ITEM #124: MILK COOLER

Quantity: One (1)
Type: Beverage-Air
Model No.: SM58N
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Heavy duty casters with brakes.

ITEM #125: REFRIGERATOR DISPLAY

Quantity: Two (2)
Type: Beverage-Air
Model No.: LV49-1-W
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #126: MOP SINK

Quantity: One (1)
Type: Advance Tabco
Model No.: 9-OP-20-X
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. K-245 Utility shelf.
2. K-240 Service Faucet.
3. K-242 Mop Hanger

ITEM #127: SPARE NUMBER

ITEM #128: SPARE NUMBER

ITEM #129: POS TERMINALS (BY OWNER)

Quantity: Two (2)

ITEM #130: BUFFET/CAFETERIA, FLAT TOP

Quantity: Two (2)
Type: Duke Manufacturing
Model No.: TCS-30
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Verify panel colors with district.
2. Heavy duty casters with brakes.
3. Solid stainless steel tray slide.
4. Grommet hole in top.
5. Locking drawer.

ITEM #131: ESPRESSO MACHINE

Quantity: One (1)
Type: Franke
Model No.: E 2M HD AS

SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Connect to water filter system.

ITEM #132: COFFEE MAKER

Quantity: One (1)
Type: Bunn-O-Matic
Model No.: 20900.0011
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

ITEM #133: SPARE NUMBER

ITEM #134: SPARE NUMBER

ITEM #135: TABLE, TEACHERS

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: TSS-307
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with stainless steel crossrails.
2. 5” diameter heavy duty non marking casters, two with brakes.

ITEM #136: TABLE, STUDENT

Quantity: Six (6)
Type: Advance Tabco
Model No.: TSS-307
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with stainless steel crossrails.
2. 5” diameter heavy duty non marking casters, two with brakes.

ITEM #137: REFRIGERATOR, UNDERCOUNTER

Quantity: One (1)
Type: Beverage-Air
Model No.: UCRD48A
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #138: SPARE NUMBER

ITEM #139: CUP DISPENSER

Quantity: One (1)
Type: Dispense-Rite
Model No.: BFL-S-3BT
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

ITEM #140: CORNER GUARD

Quantity: One-LOT (1-LOT)
Type: Custom
Model No.: Custom Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. All 16 Gauge stainless steel construction.
2. See plan for length, width and configuration.
3. See standard detail sheet.

ITEM #141: BUFFFET/CAFETERIA, DISPLAY DOUBLE DECK

Quantity: One (1)
Type: Federal Industries
Model No.: CK-5
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

ITEM #142: ICE MACHINE, UNDER CABINET

Quantity: One (1)
Type: Scotsman
Model No.: NU130GA-1
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical

ITEM #143: MIXER / BLENDER

Quantity: One (1)
Type: Robot Coupe
Model No.: Blixer 6
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #144: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: WS-12-72
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #145: SHELF, WALL MOUNT

Quantity: One (1)
Type: Advance Tabco or Alternate
Model No.: WS-12-72
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator.

ITEM #146: STAINLESS STEEL MICROWAVE SHELF

Quantity: One (1)
Type: Advance Tabco
Model No.: MS-24-24
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

ITEM #147: MICROWAVE OVEN

Quantity: One (1)
Type: Amana
Model No.: RMS10D
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #148: STAINLESS STEEL WALL FLASHING

Quantity: Four (4)
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Stainless steel flashing to cover wall behind and adjacent to the cooking equipment, from the finished floor to the bottom of the exhaust hood, the length and width of the exhaust hood. Provide trim strips and batten strips as required.
2. Refer to detail 17-R2.
Division.

ITEM #149: DISHMACHINE, UNDERCOUNTER

Quantity: Three (3)
Type: Champion
Model No.: UH-200B
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. 70 degree rise booster heater.

ITEM #150: SINK, DROP-IN

Quantity: One (1)
Type: Advance Tabco
Model No.: DI-1-168
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. K-52 deck mounted faucet.

ITEM #151: SINK, HAND, WALL MOUNT

Quantity: Six (6)
Type: Advance Tabco
Model No.: CHS-1
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Deck mounted faucet and basket drain.

ITEM #152: EXHAUST HOOD (BY MECHANICAL ENGINEER)

Quantity: One (1)

ITEM #153: FIRE SUPPRESSION SYSTEM (BY MECHANICAL ENGINEER)

Quantity: One (1)

ITEM #154: STAINLESS STEEL WALL CAP
Quantity: One-LOT (1-LOT)
Type: Custom
Model No.: Custom Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. All 16 Gauge stainless steel construction.
2. See plan for length, width and configuration.
3. See standard detail sheet.

ITEM #155: MICROWAVE

Quantity: Eight (8)
Type: Panasonic
Model No.: NE-1022
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical
2. Provide space in item 162. Refer to elevation 3-6KA301.

ITEM #156: UTILITY DISTRIBUTION SYSTEM

Quantity: Two (2)
Type: Captive Aire
Model No.: UDI - Custom
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

Model: UDI (Island Applications)

Description: A Utility Distribution System shall provided be as indicated on drawings. Systems shall have two vertical risers, one on each end, with one dedicated to electrical and the other to plumbing. The horizontal distribution raceway between the risers shall be separated into electrical and plumbing compartments and each shall be completely enclosed and water tight with removable access panels. The risers and raceway shall be constructed of 16 gauge, type 304 stainless steel, #4 finish. A circuit protected dual convenience outlet shall be provided on each riser. Service connections shall be located behind easily removable access panels.

Approvals: Unit(s) shall be ETL Listed to US and Canadian Standards, ETL Sanitation Listed, AGA and MA approved.

General Construction and Features

- **Electrical Riser:** Main power connection shall be made to the main circuit breaker which has a shunt trip and is mounted in the electrical riser.
- **Wireway systems:** Electrical power shall be fed through a main circuit breaker to a distribution panel which contains individual branch breakers. Each appliance is fed from the individual breakers which are wired to each receptacle located along the raceway.
- **Plumbing Riser:** The plumbing riser shall house manual (quarter-turn) shut-off valves for each incoming main supply line located in the UDS. The plumbing manifolds shall be provided with stub-outs along the raceway for the individual plumbing connections. Each stub-out shall be equipped with a manual (quarter-turn) shut-off valve.

- **Expandability:** All electrical systems are designed for additional capacity for future expansion or upgrade of connected appliances.
- **Wireway:** Electrical distribution panel located in the riser shall be equipped with branch circuit breakers and sized for expansion.
- **Serviceability and Accessibility:** Lift out doors shall provide easy access to risers without moving cooking equipment, in most cases. Removable panels provided along the length of the raceway shall allow access to either plumbing or electrical compartments.
- **Electric Outlets and Cord Sets:** All outlets shall provide moisture resistant covers and have been sized per NEMA standards. Each is supplied with a matching cord and plug set if these are not already supplied by the equipment manufacturer. Twist-lock sets are standard in island applications. All 120V, single phase 15 and 20 amp receptacles are DCO-GFI.
- **Main Disconnect:** One point disconnect through a main circuit breaker equipped with a 120 VAC rated shunt trip provided in the riser.
- **Gas Solenoid Valve:** Electrical or Mechanical. Electrical valves shall be provided with a manual reset button and time delay relay to prevent pilot lights from going out in momentary power outages.
- **Shunt Trip:** Shall be provided with each main breaker.
- **Appliance Protection:** Each electrical outlet connection shall be protected with an individual circuit breaker.

Electrical

- **Wireway Systems:** The electrical system shall consist of a main circuit breaker which feeds power to a distribution panel located in the electrical riser containing individual branch breakers. Each appliance is fed from the individual breakers which are wired to each receptacle located along the raceway and shall be completely isolated from the plumbing supply manifolds. The main circuit breaker shall be equipped with a built-in 120 VAC rated shunt trip and shall be located in the electrical riser requiring a single point incoming connection. Terminal block connections shall be provided for field interconnection between the shunt trip and the fire protection system for power shut-off in the event of a fire. All outlets shall be equipped with grounding type receptacles having specific NEMA polarized configurations and located on the under side (Model UDI) or front side (Model UDW) of the raceway at each equipment location. Outlets are matched to the cord and plug sets supplied with equipment. On the Model UDI, all 120V, single phase 15 and 20 AMP receptacles are DCO-GFI. Twist lock cord and plug sets are provided for equipment supplied without cords. On the Model UDW, straight blade cord and plug sets are provided for equipment supplied without cords.

- **Main Circuit Breaker:** 15 to 600 Ampere, 1 or 3 phase

    - 120, 208, or 480 VAC System
    - Branch Circuit Breaker: 15 to 100 Ampere, 1 or 3 phase
    - 120, 208, or 480 VAC System

Plumbing

- The plumbing compartment shall be completely isolated from the electrical with all piping labeled.
- Hot and cold water and steam supply and return manifolds shall be insulated.

- All incoming service connections shall be provided with 1/4 shut-off valve. Each branch connection shall be provided with 1/4 shut-off valve, with color coded hoses, and located at each equipment location.
- Color coded quick disconnect hoses are provided for connection to equipment.
- Hot and cold water piping, including branch connections, shall be type "L" copper tubing. All fittings will be copper sweat soldered (95-5 type).
- Gas and steam piping, including branch connections, shall be threaded black iron. There shall be a drip tee on the incoming gas end. The gas manifold shall be furnished with either an electrical or mechanical gas valve which shall be field interlocked with the fire protection system to shut off fuel sources in the event of a fire. Electrical gas valves shall be furnished with a manual gas reset button and time delay relay to prevent pilot lights from going out in momentary power outages, located in the UDS riser.
- Gas manifolds are sized for an inlet pressure of 7" WC for natural gas or 11" WC for LP.

Gas Equipment

All gas equipment shall conform to local-Code requirements

- Manifold (single or looped): 3/4" to 3" IPS
- 1/4 turn manual shut-off valve on manifold
- Quick disconnect hoses: 1/4" to 1-1/4", up to 6' long
- Quick disconnect fittings: 1/4" to 1-1/4" with 1/4 shut-off valves

Hot and Cold Water

- Manifold: 3/4" to 1" IPS
- 1/4 turn manual shut-off valve on manifold
- Quick disconnect hoses: 1/4" to 1", up to 6' long
- Quick disconnect fittings: 1/4" to 1" with 1/4 shut-off valves
- Steam Supply/Steam Return
- Steam Manifold: 3/4" to 3" IPS
- Condensate Return Manifold: 3/4" to 2" IPS
- 1/4 turn manual valves on manifolds
- Quick disconnect hoses: 1/4" to 1-1/4", up to 6' long
- Quick disconnect fittings: 1/4" to 1-1/4" with 1/4 shut-off valves

Factory Tested

Unit(s) shall be operated, tested and set at the factory using job-site conditions for electrical and gas input. All operating and safety controls shall be tested and set at the factory.

Service and Parts

The supplier shall furnish gas piping schematics, **as built** wiring connection and control-circuit diagrams, dimension sheets and a full description of the unit(s). Service manuals showing service and maintenance requirements, shall be provided with each unit.

ITEM #157: TABLE, WORK
Quantity: Two (2)

Type: Advance Tabco or Alternate
Model No.: KSS-305
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide space under for Item 149 Under counter Dishmachine, undershelf in remaining area .

ITEM #158: 36” RANGE – 4 BURNERS WITH CONVECTION OVEN

Quantity: Eight (8)
Type: Vulcan
Model No.: V4B36C
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify altitude and type of gas.
2. Gas pressure regulating valve with built-in vent limiting device.
3. Factory gas interconnection.
4. One (1) Dormont #1675KIT2S-48 or T&S #HG-4D-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing Division's use in installing the hose components.

ITEM #159: BROILER, UNDER-FIRED

Quantity: Four (4)
Type: Vulcan
Model No.: VCCB36
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify altitude and type of gas.
2. Gas pressure regulating valve with built-in vent limiting device.
3. Factory gas interconnection.
4. One (1) Dormont #1675KIT2S-48 or T&S #HG-4D-SK-48 commercial use A.G.A. and N.S.F. Approved poly coated flexible stainless steel gas hose assembly 48" long, with swivel links on both ends, quick disconnect assembly on one end, and with installation/restraining kit. Install the restraining device and provide instructions and coordination for the Plumbing Division's use in installing the hose components.
5. Stainless steel stand with undershelf and casters.

ITEM #160: SHELF, WALL MOUNT

Quantity: Two (2)
Type: Advance Tabco or Alternate
Model No.: WS-12108
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator

ITEM #161: SINK, SCULLERY, 3 COMPARTMENT

Quantity: Two (2) One (1) Reverse
Type: Custom
Model No.: Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (3) 24” x 24” x 14” deep sinks with rotary drains.
2. (2) Two Fisher splash mounted faucets.
3. Overflow trough between last sink and Item 164 Disposer.
4. Install Item 164 Disposer in drain board as shown on plan.
5. Size and shape per plan.

ITEM #162: TABLE, WORK

Quantity: Nine (9)
Type: Eagle Group or Alternate
Model No.: T3060STB
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with under shelf.
2. 5” diameter heavy duty non-marking casters, two with brakes.
3. Add (3) drawers, (1) open storage space with adjustable shelving, and pan rack storage as indicated on 6.KA401-Detail-3AA.

ITEM #163: SHELF, WALL MOUNT

Quantity: Two (2)
Type: Advance Tabco or Alternate
Model No.: WS-12108
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Verify installation height with operator

ITEM #164: GARBAGE DISPOSER

Quantity: Two (2)
Type: In sink Erator
Model No.: SS-100-15C-AS-101
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Sink Bowl Assembly, 15” with one adjustable water nozzle.
2. With AS-101 Control Center “Aqua Saver” with auto reverse.
3. Install assembly in Item #161, as shown on plans.
4. Fisher 2210-WB splash mounted pre-rinse faucet with Fisher #10197 spray valve.

ITEM #165: SINK, SCULLERY, 1 COMPARTMENT

Quantity: Four (4)
Type: Advance Tabco or Alternate
Model No.: 94-1-24-24RL
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. (1) One splash mounted faucet and rotary drain.
2. Size and shape per plan.
3. Add cabinet doors under each drain board for additional storage as indicated on elevation 6.KA402-Detail-3GA.

ITEM #166: ICE MAKER WITH BIN

Quantity: One (1)
Type: Scotsman
Model No.: CU3030MA-1A
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Provide with filtration system.

ITEM #167: REFRIGERATOR, REACH-IN

Quantity: Two (2)
Type: Beverage-Air
Model No.: HRP2-S
SID No.: T076
Furnish and set in place per manufacturer's specifications and the following:

1. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.
2. Heavy duty casters with brakes.

ITEM #168: STACKED WASHER/ DRYER

Quantity: One (1)
Type: Speed Queen
Model No.: ATE50F/ATG50F
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Overall Dimensions - 75 1/4" x 26 7/8" x 28"
2. Provide with heavy-duty cord and plug assembly. Coordinate NEMA configuration with Electrical Division.

ITEM #169: MOP SINK

Quantity: One (1)
Type: Advance Tabco
Model No.: 9-OP-20
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. K-245 Utility shelf.
2. K-240 Service Faucet.
3. K-242 Mop Hanger

ITEM #170: WALK-IN FREEZER

Quantity: One (1)
Type: ThermalRite
Model No.: Pre-fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Walk-in cooler to be prefabricated of modular design and construction.
2. Panels to be interchangeable, with U.L. Labeled, CFC free urethane insulation sandwiched between interior and exterior metal surfaces, with an overall thickness of 4 inches. Edges of panels to be high-density urethane "tongue and groove", with cam-lock assemblies, set-in-place at time of fabrication. The access ports are to be on the interior, for inside assembly of the walk-in, and shall be covered with "snap caps". Interior and exterior finishes are to be manufacturer's standard gage stucco embossed aluminum. Floor specified by Architect and install by General Contractor. No wood will be permitted in any panels or doors.
3. One (1) 34" x 78" entrance door and frames. Doors to have three (3) hinges as shown on plans. The doors are to be flush type, constructed and insulated in the same manner as the wall panels, and finished inside and out, to match adjacent walls. Doors and door sections to be equipped with the following:

a. Magnetic gasket, hydraulic piston driven door closer and cam lift hinges. Hardware to have provisions for locking and a safety release to prevent entrapment of personnel within the box.
b. Provide each entrance door section with an incandescent type vapor-proof light with clear globe and heavy-duty 100-watt clear bulb to provide 50’ candles , pilot light switch and conduit between switch box and outlet box. All conduit and wiring to be concealed, where possible.
c. Entrance door(s) in exterior walls of cooler to have vinyl strip curtains.
d. Unheated pressure relief ports air-vent in cooler compartment.
e. Audio-visual alarm for each compartment, to be included in door section, with remote sensor and adjustable alarm points to indicate the temperature inside, and sound an alarm when the temperature is unsatisfactory. The alarm shall have a mute switch to silence the audible alarm and a reset button to reset the alarm once the temperature conditions are satisfactory.
f. Provide view ports (12x12)

4. (Lot) LED light fixtures, with heavy-duty protective shield, for field installation by the Electrical Division. All light fixtures to be U.L. Listed for use inside walk-in cooler (50 foot candle). All conduit and wiring is to be concealed, where possible.
5. Matching finish trim strips, from floor to ceiling, at all exposed vertical edges, corners, and joints to building walls. Contractor to verify dimensions.
6. Matching finish closure panels from top of walk-in to finished ceiling, on exposed sides.
7. Unit and all components to be N.S.F. Approved, U.L. Labeled and U.L. Classified with a flame spread of 25 or less, and meet the April 1, 1998 requirements of N.S.F. Standard #7.
8. For any installation requiring additional ceiling support, provide self-supporting ceiling structural framework over the top of the walk-in compartments, and supported by the walk-in walls.
9. Verify all dimensions with building conditions for proper fit. Provide maximum size possible to fit available space, using standard panels.

ITEM #171: COOLER, WALK-IN

Quantity: One (1)
Type: ThermalRite
Model No.: Pre-Fabricated
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Walk-in cooler to be prefabricated of modular design and construction.
2. Panels to be interchangeable, with U.L. Labeled, CFC free urethane insulation sandwiched between interior and exterior metal surfaces, with an overall thickness of 4 inches. Edges of panels to be high-density urethane "tongue and groove", with cam-lock assemblies, set-in-place at time of fabrication. The access ports are to be on the interior, for inside assembly of the walk-in, and shall be covered with "snap caps". Interior and exterior finishes are to be manufacturer's standard gage stucco embossed aluminum. No wood will be permitted in any panels or doors.
3. One (1) 34" x 78" entrance door and frames. Doors to be hinged as shown on plans with, (three) 3-hinges. The doors are to be flush type, constructed and insulated in the same manner as the wall panels, and finished inside and out, to match adjacent walls. Doors and door sections to be equipped with the following:

a. Magnetic gasket, hydraulic piston driven door closer and cam lift hinges. Hardware to have provisions for locking and a safety release to prevent entrapment of personnel within the box.
b. Provide each entrance door section with an incandescent type vapor-proof light with clear globe and heavy-duty 100-watt clear bulb to provide 50’ candles , pilot light switch and conduit between switch box and outlet box. All conduit and wiring to be concealed, where possible.
c. Entrance door(s) in exterior walls of cooler to have vinyl strip curtains.
d. Unheated pressure relief ports air-vent in cooler compartment.
e. Audio-visual alarm for each compartment, to be included in door section, with remote sensor and adjustable alarm points to indicate the temperature inside, and sound an alarm when the temperature is unsatisfactory. The alarm shall have a mute switch to silence the audible alarm and a reset button to reset the alarm once the temperature conditions are satisfactory.
f. Provide insulated view port (12x12)

4. (Lot) LED light fixtures, with heavy-duty protective shield, for field installation by the Electrical Division. All light fixtures to be U.L. Listed for use inside walk-in cooler (50 foot candle). All conduit and wiring is to be concealed, where possible.
5. Matching finish trim strips, from floor to ceiling, at all exposed vertical edges, corners, and joints to building walls. Contractor to verify dimensions.
6. Matching finish closure panels from top of walk-in to finished ceiling, on exposed sides.
7. Unit and all components to be N.S.F. Approved, U.L. Labeled and U.L. Classified with a flame spread of 25 or less, and meet the April 1, 1998 requirements of N.S.F. Standard #7.
8. For any installation requiring additional ceiling support, provide self-supporting ceiling structural framework over the top of the walk-in compartments, and supported by the walk-in walls.
9. Verify all dimensions with building conditions for proper fit. Provide maximum size possible to fit available space, using standard panels.

ITEM #172: FREEZER COMPRESSOR

Quantity: One (1)
Type: ThermalRite / Heatcraft
Model No.: MOH025L63CFSDK
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. One (1) pre-assembled, hermetic, remote, air-cooled, cooler compartment refrigeration system. System to consist of condensing unit high side assembly and low profile evaporator coil low side assembly, evaporator mounting kit, thermostatic expansion valve, pump-down cycle kit, solenoid valve, temperature control, sight glass, drier, vibration eliminator, pressure control, crankcase heater, extreme low ambient controls, weatherproof housing, and any accessories necessary for a completely installed and functional system for a cooler box temp of -10 to -5 degrees F. Verify exact installation location with Architect, architectural plans, and site conditions.
2. Contractor’s certified refrigeration mechanic to install all components supplied with the compressor, as per manufacturer's instructions. Also furnish and install refrigeration lines, insulation, refrigerant and accessories as per manufacturer's instruction's and as required.

ITEM #173: COOLER COMPRESSOR

Quantity: One (1)
Type: ThermalRite / Heatcraft
Model No.: MOH008X62CFMT
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. One (1) pre-assembled, hermetic, remote, air-cooled, cooler compartment refrigeration system. System to consist of condensing unit high side assembly and low profile evaporator coil low side assembly, evaporator mounting kit, thermostatic expansion valve, pump-down cycle kit, solenoid valve, temperature control, sight glass, drier, vibration eliminator, pressure control, crankcase heater, extreme low ambient controls, weatherproof housing, and any accessories necessary for a completely installed and functional system for a cooler box temp of +35 to + 40 degrees F. Verify exact installation location with Architect, architectural plans, and site conditions.
2. Contractor’s certified refrigeration mechanic to install all components supplied with the compressor, as per manufacturer's instructions. Also furnish and install refrigeration lines, insulation, refrigerant and accessories as per manufacturer's instruction's and as required.

ITEM #174: SPARE NUMBER

ITEM #175: SHELVING, WIRE

Quantity: Lot (1)

Type: Nexel
Model No.: S184EP
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #176: SPARE NUMBER

ITEM #177: SHELVING, WIRE

Quantity: Lot (1)
Type: Nexel
Model No.: S1842EP
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #178: SHELVING, WIRE

Quantity: Three (3)
Type: Nexel
Model No.: S1842EP
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.
3. Provide four tiers high shelving, 74”high post.

ITEM #179: SHELVING, WIRE

Quantity: Five (5)
Type: Nexel
Model No.: S1848EP

SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Length, width and configuration per plan and verified room dimensions.
2. Provide heavy duty casters and locks.

ITEM #180: RACK, DUNNAGE

Quantity: Three (3)
Type: Cambro
Model No.: DRS36-131
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Dunnage to hold 1000 pounds.

ITEM #181: RACK, UTILITY

Quantity: Two (2)
Type: Channel
Model No.: T448A
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

1. Pan stops.
2. Provide heavy duty casters.

ITEM #182: CAN RACK

Quantity: Three (3)
Type: Piper Products or Equal
Model No.: CSR-FF-156
SID No.: T076

Furnish and set in place per manufacturer's specifications and the following:

END OF SECTION

SECTION 11 51 00

LIBRARY EQUIPMENT

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:
1. Library shelving, fixed and mobile.
2. Book drop.
3. Book cart.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, furnished specialties and accessories, and finishes.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Equipment access points and required space for equipment service and operation.
3. Setting drawings, templates, and instructions for installing anchor bolts and other anchorages.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Manufacturer and Installer.

B. Product Certificates: For each type of equipment, from manufacturer.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For library equipment, to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Shelving Manufacturer Qualifications: An experienced manufacturer who has been manufacturing this type of shelving continuously at the same location for a period of not less than 50 years.

B. Shelving Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect finished surfaces from soiling and damage during handling and installation.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install library equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.9 WARRANTY

A. Provide written warranty, executed by contractor, installer, and manufacturer, agreeing to repair or replace units, which fail in materials or workmanship within the established warranty period. This warranty shall be in addition to, and not a limitation of, other rights the owner may have under general conditions provisions of the contract documents.

1. Lifetime warranty: Subject to the terms in the written warranty, warrant the original purchaser exclusively that the shelving manufactured by it will be free from defects in materials and workmanship for the lifetime of the case-type shelving.

PART 2 - PRODUCTS

2.1 LIBRARY SHELVING

A. General: Cantilever-Type Adjustable Metal Shelving on welded frame, including canopy top, adjustable shelves, backstop support, wire book supports, end brackets, and kick plate.
   1. Capacity: Capable of supporting 50 lbs per lineal foot.
   2. Accessories: Provide Adjustable threaded levelers, card holders, and range finders.
   3. Finishes:
      a. Metal Components and Accessories: All shelving components including accessories shall be steel finished with an electrostatically applied powder coat.
      b. Wood End Panels and Tops: Manufacturer's standard wood veneer finish, as selected from manufacturer's full range.
   4. Sizes:
      a. 42 inch high double-sided, 10 inch depth – L423620FB.
      b. 66 inch high single-sided, 10 inch depth – L663610FB.
      c. And as indicated on the drawings.
   5. Seismic Performance: Provide case-type metal shelving capable of withstanding the effects of earthquake motion as required by applicable building codes.
   ~~5.~~6. Mobile shelves: Where shelves are indicated to be mobile, provide shelf-unit base and swivel casters that allow free movement of the unit.

B. Basis of Design: Subject to compliance with requirements, provide Aetnastak by Montel, or comparable products by one of the following:
   1. Aurora Storage Products, Inc.
   2. Brodart Contract Furniture.
   3. Tesco Industries LP.

2.2 BOOK DROP

A. Basis of Design: Subject to compliance with requirements, provide Model HSU for Books and Media with Model HSU Interior Delivery Chute, by American Book Returns, or comparable product by one of the following:
   1. Acceptable Substitution: See section 01 60 00 Product Requirements.

B. Stainless steel flange and push plate with powder coated interior sleeve.
   1. Black signs: BOOK DROP and PUSH TO OPEN.
   2. Clear opening 3 ¾ inch by 12 7/8 inch.

2.3 BOOK CARTS

A. Book Cart Basis of Design: Subject to compliance with requirements, provide Undercounter Book Truck for 150 Books, by American Book Returns, or comparable product by one of the following:
   1. Acceptable Substitution: See section 01 60 00 Product Requirements.
   2. Size: 24 inches by 24 inches, by 24 inches high.
   3. Construction: Heavy gauge powder-coated steel with no-tip depressible floor and 4 three-inch hard-rubber casters. Color as selected by Architect from manufacturer's full range of standard colors.

B. Extra Book Cart Basis of Design: Subject to compliance with requirements, provide Extra M910 Book Truck for 375 Books, by American Book Returns, or comparable product by one of the following:
   1. Acceptable Substitution: See section 01 60 00 Product Requirements.
   2. Size: 24 inches by 24 inches, by 24 inches high.
   3. Construction: Heavy gauge galvanized steel with no-tip depressible floor and 4 four-inch hard-rubber casters.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements. Examine walls and floors for suitable conditions.

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

3.2 INSTALLATION

A. Install equipment plumb, level, rigid and securely anchored to building and adjacent furniture in proper location, in accordance with manufacturer's instructions.

3.3 ADJUSTING AND CLEANING

A. Moving Parts: Carefully check and adjust moving parts to ensure smooth, near silent and accurate sash operation.

B. Clean surfaces, including both sides of sash.

C. Repair damaged work to be equal to new, undamaged work, or replace with new units.

END OF SECTION 11 51 00

SECTION 11 52 00

AUDIO AND VIDEO SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section valid only when considered in total with all other Audio & Video System Contract Documents. References are for the convenience of the reader and their inclusion in or omission from any Section in no way limits its scope or intent of any Contract Document.

B. This Section includes the following Audio and Video (AV) Systems:

1. Theater
2. Vocal/Orchestra Classroom E206 & Instrumental/Band Classroom E103
3. Portable Recording System
4. Commons F201C
5. Main B102 & Auxiliary B101 Gyms
6. Weight/Fitness Room A103
7. Health Classroom A104 & Lecture Classrooms G302, G303
8. Main B102 & Auxiliary B101 Gyms Enhancement Alternate
9. Weight/Fitness Room Enhancement Alternate B002

1.2 RELATED DOCUMENTS:

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

B. Division 26 Electrical and Division 27 Communications, refer to Drawings

1.3 RELATED WORK BY ELECTRICAL CONTRACTOR

A. Furnish and install conduit and receptacle boxes for the Audio and Video Systems as shown on the AV drawings and/or electrical drawings and as specified in Division 26. Conduit shall have pull-string installed and left in place. This includes all conduit and all receptacle boxes for audio and video "Base Bid" and "Bid Alternates" whether elected or not.

B. Furnish and install all electrical conduit, wiring and receptacle boxes for electrical power for the Audio and Video System equipment as specified under Division 26.

C. Furnish and install all telecommunication cabling, connections, conduit and boxes for telecom connections to the Audio and Video System equipment as specified under Division 27.

D. Furnish and install non-metallic conduit connections to audio & video system equipment racks to isolate equipment grounds from conduit ground.

E. Install audio & video system equipment racks, floor boxes and enclosures provided by Audio & Video Contractor as shown on the Audio and Video (AV) drawings

F. Furnish and install system grounding as described herein.

1.4 DESCRIPTION OF WORK

A. The work as described herein shall be furnished and installed by one firm alone. The contractor shall furnish, install, assemble, set up, and test (hereinafter "provide") the following systems in accordance with the Contract Documents.

B. The contractor shall be responsible for complete integration of the Audio & Video System design, including modifications required by other disciplines and design modifications that may result from substitution of equipment other than specified herein.

C. The work shall be provided complete and the system shall be fully operational. The Audio & Video System is shown on drawings AV 100, 101, 102, 103, 104, 301, 302, 501, 502, 601, 602, 603, & 604.

D. The specifications and drawings shall be read and used together. System features, which are mentioned in the one, are not necessarily shown in the other. In case of conflict between the drawings and specification, request clarification.

1.5 SYSTEM DESCRIPTION

Theater

The Theater AV system consists of a renovation and replacement of the existing systems.

The existing analog audio system will be replaced with a new digital system. The existing "mixer field" microphone inputs and audio returns located throughout the control room, house, and stage should be removed. Remove conduit and existing cabling where exposed in the house. Abandon conduit and cabling where hidden in walls/ceilings and where located in the stage. The existing center speaker cluster above the proscenium opening should also be removed.

The new digital audio system consists of a Roland M-480 digital console and a compliment of digital audio snake heads for I/O routing. Audio is transported over Cat5 cabling and new Cat5 connection plates are located at the Front of House position, orchestra pit, and at Stage Left at the rack location. New, self-powered speakers for a Left, Center, Right, and Subwoofer are included in the package for audio playback. The system is also equipped with an Assisted Listening System. The antenna for the ALS system should be mounted on top of the control room rack, near the control room window opening for good RF coverage in the house.

The owner currently has 24 AKG wireless microphones. The new system will mount all of these owner provided wireless receivers into the control room rack with antenna dividers to consolidate all of the wireless antennas to one RF diversity fin antenna. The diversity fin antenna should be located in the control room window opening for good coverage of the wireless microphones throughout the house and stage.

The existing Video system consists of a video projector mounted to the wall at the control room window. This projector should be removed and provided to the owner.

The new Video system consists of a new video projector mounted under the control room window from the performance light batten as well as a video switcher located in the control room rack and 5 video inputs: stage left, stage right, orchestra pit, FOH, and control room. Audio from the video switcher is routed to the audio system via an input in the control room rack. Control of the Video system is provided by a wireless (wifi & RF) remote. Mount the antenna for the control system in the house near the control room window opening to ensure acceptable coverage for the remote in the control room, new FOH position, house, orchestra pit, and stage area.

The existing Intercom system consists of a 4-channel party line ClearCom system. The existing base station is located in the control room and microphone/speaker stations are located in the light storage room, catwalk, ticket booth, side lights at house right and house left, costume storage, girls dressing room, boys dressing room, and upstage and downstage at stage right and left, for a total of 12 different locations. The base station and microphone/speaker stations should be removed. The existing cabling should be tested for continuity and replaced, if needed.

A new ClearCom base station and microphone/speaker stations should be replaced for the old equipment. In addition, a small wireless intercom system should be attached to the base station to provide intercom at the new FOH position, and throughout the house and stage. The wireless intercom antenna should be mounted in the intercom rack near the control room window opening for good RF coverage.

Ensure that all wireless equipment (intercom, microphones, control processors, etc) are on different wireless frequencies or bands to avoid interference in the Theater.

Vocal/Orchestra & Instrumental/Band Classrooms

The new Classroom audio systems are simple recording and playback systems. The racks are wall mounted in casework, refer to the architectural drawings.

The systems consist of:

++ ceiling suspended microphone pair for recording

++ custom line-level rack input plate for line level sources

++ rack mounted mixer to adjust microphone and line level inputs

++ rack mounted solid state memory / CD recorder/player

++ rack mounted amplifier

++ wall mounted speakers for audio playback

The system also uses a ducking module that should be tied into the building fire and intercom systems for automatic ducking of the audio system.

Portable Recording System

The portable recording system consists of a portable rack with custom microphone input plate for 8 channels, rack mounted microphone mixer, and rack mounted solid state memory & CD recorder.

The portable recording system is intended for use by the Vocal/Orchestra Classroom students and should be provided in the storage room for the classroom.

Commons

The Commons AV system consists of a large 16:10 projection screen and video projector suspended using a scissor lift. Ceiling speakers are located throughout the space. Zone the speakers into 2 presets: Main Commons and Main + Upper Commons.

AV inputs and touch panel controls are located at the bottom of the stairs in the lower commons. The equipment rack is located in casework, refer to the architectural drawings.

Main & Auxillary Gyms

The Main and Aux Gym systems, both the base and enhanced alternate designs, consist of basic audio reinforcement with suspended pendant speakers. Inputs consist of wireless microphones, CD/ipod player, and 1/8" stereo jacks for mp3 player inputs. A rack mixer is located in the equipment rack to adjust audio levels.

Weight/Fitness Room

The Weight/Fitness Room, both the base and enhanced alternate designs, consist of basic music playback with ceiling speakers. Inputs consist of a CD/ipod player. A rack mixer amplifier is located in the equipment rack to adjust audio levels.

Health Classroom & Lecture Classrooms

The Health Classroom and Lecture Classrooms consist of a projection screen, projector, AV switcher, 2 ceiling speakers and a touch panel control for simple control over the system. Inputs consist of 2 wall plate inputs, wireless microphone, and bluray player located in the equipment rack. The Lecture Classroom equipment is combined to share 1 rack and 1 AV switcher.

1.6 QUALITY ASSURANCE

A. Contractor Qualifications

1. The work of this section will be contracted to a single firm, referred to as the Audio & Video Contractor, for undivided responsibility.
2. The Audio & Video Contractor shall be qualified as follows:
    a. Company specializing in installing and maintaining work of this section with a minimum of 5 years documented experience and prepared to provide proof of a minimum of 5 similar installations that have performed satisfactory for a minimum of 3 years.
    b. Installation Superintendent: Minimum of 5 years direct experience supervising similar work. The Superintendent shall be responsible for supervision of all technical and engineering work required to execute the contract, and, in particular, approve and sign all shop drawings.
    c. Installation and Maintenance Personnel: Minimum of 3 years experience installing and maintaining similar work.
    d. The Audio & Video Contractor shall have capabilities and in-house facilities for installation, shop fabrication and repair service of professional sound systems.

B. Prequalification of Audio & Video Contractors:

1. All Audio & Video Contractors submitting bids for the audio & video systems specified herein must be pre-qualified in writing by the Acoustical/AV Consultant not less than 10 days prior to the bid opening. Audio & Video Contractors desiring to be pre-qualified other than those listed below, shall submit the following required qualification statement. As a minimum the submittal shall include the following bound in flexible binders:
2. A list of audio & video systems of comparable size and scope to that described herein, completed by the Audio & Video Contractor in the last five (5) years. Show project name and address, year of completion and the name and telephone number of a person to contact who is a representative of the Owner or User.
3. A personal resume of formal education and experience of the qualified staff engineer who would direct the work.
4. A description of the Audio & Video Contractor's capabilities and facilities for rack assembly, shop fabrication, repair and servicing of audio & video systems.

C. Prequalified Audio & Video Contractors:

1. National Speaker & Sound
   Denver, CO
   (303) 777-6400
2. CCS Presentation Systems
   Denver, CO
   (303) 694-3323
3. AVI SPL

Englewood, CO
(303) 792-3090

4. AVI Systems
Englewood, CO
(303) 349-8933

5. Ford AV
Denver, CO
(720) 374-2345

6. Audiomatrix
Cheyenne, WY
(800) 736-5094

7. API Systems Integrators
Casper, WY
(307) 266-5222

8. Xcite Audiovisuals
Centennial, CO
(303) 751-1478

9. Digital Roads
Wheat Ridge, CO
(303) 422-4500

10. LVW
Colorado springs, CO
(719) 540-8900

11. Whitlock
Denver, CO
(303) 799-1480

D. Codes & Conflicts:

1. Perform installation in accordance with all applicable international, federal, state, county, municipal and local codes and regulations. In addition, the work shall be in accordance with the latest revisions of all applicable standards and specifications of the following.
   a. NAB – National Association of Broadcaster
   b. UL – Underwriters Laboratories
   c. EIA – Electrical Industries Association
   d. NEC – National Electrical Code

2. Present to Construction Manager any conflicts between codes, regulations, specifications and/or requirements at least thirty (30) days prior to the commencement of the scheduled work.

1.7 SUBMITTALS AND CLOSEOUT ITEMS

A. All submittals shall be in accordance with Division 1 General Contract Conditions. Additional, more restrictive conditions are established herein for the work of this section.

B. Field and Shop Drawing Submittal: The shop drawings shall be submitted after award of contract. Contractor shall submit the required number of copies of the following for review and approval as defined in Division 1:

1. Complete floor plans, at scale of Contract Documents, showing the locations throughout the project of all receptacles, conduits, wireways, trays, pull boxes, junction boxes, equipment racks, equipment and other devices with appropriate designations.
2. Complete list of proposed equipment to be used with accompanying cut sheets. Equipment list should follow the order "Description, Manufacturer, Model, Quantity, System", or similar, for easy comparison to construction documents. Cut sheets should follow the order of the submitted list. CUT SHEETS BY THEMSELVES, IN NO PARTICULAR ORDER, WILL NOT BE ACCEPTABLE AND WILL BE REJECTED FOR RESUBMITTAL.
3. Complete system riser diagrams, showing all elevations, room numbers, conduit sizes, types and fills, box sizes and types, devices, equipment and rack designations.
4. Complete scaled (1"=1'-0" or larger) actual equipment rack elevation drawings, including equipment designation, manufacturer's name, model number, rack location and rack designation. Construction drawings detail the suggested equipment locations only.
5. Elevations of the room walls indicating size and location of all outlets and receptacles to be coordinated with the Theatrical Equipment Installation Contractor, General Contractor and Electrical Contractor.
6. Complete run sheets and cable schedules associated with each equipment rack and/or any isolated piece of equipment or device, including cable designation, type, manufacturer and manufacturer's type, number, wire color, device, and terminal designation and device location, keyed to both the system block diagram and equipment rack elevation drawings.
7. Complete detailed drawings of all contractor-fabricated items, showing all components, devices and equipment, including dimensions, component values, terminal designations, types, locations, manufacturer's name and model number.
8. Complete detailed drawings of all fabricated equipment rack panel assemblies and all input/output wall panel assemblies, showing all components, devices, connectors, color, finishes and legends, including dimensions, locations, and name, address and phone number of fabricator. Submittal required for all fabricated assemblies including commercially manufactured and custom machined panel assemblies.
9. A complete list of the proposed function identification labels for all rack mounted audio, video and control equipment. Label specifics are noted in part 3.07 of this section.
10. If any modification is required to any structural component of the facility to facilitate the installation of the audio system, such modifications must be submitted for review by the Project Structural Engineer. Installation shall not commence prior to review and acceptance by the Project Structural Engineer.

C. Closeout Items:

1. Submit the following Record Drawings developed from the final "as built" systems. Comply with Division 1, General Contract Conditions and the following:
    a. Three (3) copies and one (1) reproducible of each of the block diagrams, plans, risers, rack elevations, cable schedules and detail drawings. Reproducible shall be in the form of AutoCAD DWG drawing files.
2. No more than thirty (30) days after Acceptance Testing, submit three (3) bound copies of each of the following manuals prior to, and as a requirement of, Owner acceptance of the work of this section:
    a. Equipment operating instructions; complete, comprehensive instructions for the operations of all contractor-fabricated devices and equipment items provided as part of the work of this section.

b. Systems operating instructions; step-by-step, complete, comprehensive instructions for the operation of the systems provided as part of the work of this section. Including the normal settings of all front panel controls or switches.

c. Manufacturer's original operation, instruction and service manuals; all brochures, manuals and service sheets published by the manufacturers of the components, devices and equipment supplied. Original printed copies only, photocopies not acceptable.

d. Printed material within contractor-fabricated equipment and systems operating manuals shall be bond paper copies. Drawings, charts and graphs shall be on bond paper. The systems contractor-fabricated equipment instruction manuals shall be composed using a single, consistent visual format and writing style; text shall be derived from component equipment manufacturer's instruction manuals and may include reproductions of artwork and other materials.

3. Submit three (3) copies of each of the following schedules, lists, and data prior to, and as a requirement of, owner's acceptance of the work of this section:

a. Final bills of quantities; complete bills of quantities all material as delivered, including a separate schedule of ancillary or portable equipment.

b. Performance, test and adjustment data including comprehensive documentation of all performance verification and correction procedures and measurements.

c. Maintenance and spare parts schedules; a comprehensive tabulation of equipment, devices, miscellaneous parts and maintenance items, including manufacturer's name, address, model number, systems use and miscellaneous information.

4. Keys:

a. Provide three (3) complete sets of keys for the operation of each and every rack, cabinet, door, drawer, switch and any other such device, and a complete, comprehensive schedule of such keying.

5. No more than thirty (30) days after Acceptance Testing, provide three (3) copies of the following:

a. Certificates: any and all licenses, certificates of operation and/or compliance.

1.8 WARRANTY:

A. Guarantee all components to be free of defects in material and workmanship for a period of two (2) year from date of final acceptance. Provide a written two (2) year warranty, signed by the Contractor, due on the date of the final acceptance.

B. Paint and exterior finishes, fuses and lamps are excluded from above guarantees except when damage or failure results from defective materials or workmanship covered by the guarantee.

C. To maintain certain manufacturer's warranties, said equipment must be installed, aligned and serviced by those installers authorized by said manufacturer to perform those duties. If the contractor is not authorized by said manufacturer it is his sole responsibility to make the appropriate arrangements and bear all cost and consequences thereof.

D. The vendor shall include a statement of warranty on the entire system and on the individual pieces of equipment. The system warranty shall be for a minimum of 365 days from the date of system acceptance by the Owner. This warranty shall obligate the Contractor to provide all equipment, material, and labor at no charge to the Owner, during the warranty period, in the event of a system or equipment malfunction, with the exception of PBO equipment provided for integration into these systems.

E. In cases where the manufacturer's warranty period is greater than twelve months, the contractor must be prepared to honor that warranty for the full extent of the manufacturer's warranty period. This shall exclude any labor costs incurred by the contractor removing and re-installing the defective items. In cases where the manufacturer's warranty period is less than 12 months, the contractor is liable for defects in the item up to-but not exceeding-the first twelve-monthperiod on any contractor provided items.

F. All manufacturers' equipment warranties shall be activated by the Contractor in the Owner's name and shall commence on the date of system acceptance.

G. In the case of Contractor-modified equipment, the manufacturer's warranty is normally voided. In such cases, the Contractor shall provide the Owner with a warranty equivalent to that of the original manufacturer.

H. Telephone Support

1. The Contractor shall respond via telephone within two (2) hours to any request for service. This first contact should outline the nature of the problem or functional anomaly. The Contractor shall make available an individual knowledgeable with the installed system, and who can address specific system issues described by the system operators.

I. On-Site Support

1. The system warranty shall be an "on-site" warranty, with a twenty-four (24) hour response time. Telephone support shall be available between normal business hours, Monday through Friday.

1.9 SERVICE:

A. Replace defective materials and repair faulty workmanship within 72 hours of discovery at no cost to the Owner during warranty period.

B. At no additional charge, provide maintenance service for a period of one (1) year after final acceptance of installation. This service shall consist of at least one visit six (6) months and on visit eleven (11) months after final acceptance for checking the equipment and making any necessary adjustments.

C. If during a period of two (2) year from date of final acceptance, any component is out of service for more than one week, due to unavailability of parts or service within that period, supply and install an identical new component. If an identical system component is not available, substitute an equivalent piece, but only with the approval of the Owner and Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Material and equipment specified herein have been selected as the basis of acceptable quality and performance and have been coordinated to function as components of the included systems. Where a particular material, device, piece of equipment or system is specified directly, the current manufacturer's specification for the same shall be considered to be a part of these specifications, as if completely contained herein in every detail.

B. All materials specified herein shall be new and shall be the manufacturer's latest design, permanently labeled with the manufacturer's name, model number and serial number. All active circuitry shall be solid state and shall be rated for continuous use. Similar devices shall be of the same manufacturer, unless specifically noted otherwise in these specifications.

C. All electronic equipment shall be of the "dead-front" type and shall be designed for standard 19" EIA rack mounting, unless noted otherwise.

D. Principal items of equipment and apparatus are identified herein by part number and manufacturer. Alternate manufacturers are identified in instances in which equivalence had been determined.

E. For all items which are identified by part number and manufacturer, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written out herein.

F. For those items, which are not identified by part number and manufacturer, the Audio & Video Contractor may select items, which conform to the functional and /or technical specifications. For all such items, the Audio & Video Contractor shall submit for approval all technical data that is available from the supplier or manufacturer.

G. Acceptability for use in the systems shall be determined by the Acoustical/AV Consultant. Such items shall be installed only after receipt of written approval.

H. All auxiliary and incidental equipment (i.e., signal isolation transformers, protective devices such as diodes, MOV's, chokes, etc.) necessary for normal noise free operation and protection of the systems specified in this section shall be provided as if specified in full herein.

I. Asbestos Prohibition. No asbestos containing materials shall be used under this section. The contractor shall insure that all materials incorporated in the project are asbestos-free.

J. Power Rating:

1. All devices connected to the Project electrical system shall be listed by Underwriters Laboratories (UL) or an independent Electrical Testing Laboratory, and shall be so labeled.

2. All devices connected to the Project electrical system and all auxiliary equipment necessary for the operation of the equipment associated with the systems specified herein shall be designed to operate from 105 to 130 VAC, 60 Hertz service, with stable performance and fully in accordance with these specifications. All such devices shall have integral fuse or circuit breaker protection.

3. All circuit breakers shall be fully magnetic unless supplied as OEM components integral to the specified or acceptable substitution equipment.

4. Contractor-fabricated items shall be provided with either indicating type circuit breakers or fuses of the clear glass cartridge type, mounted in fuse holders that will indicate a blown or defective fuse.

5. Protection devices shall be located to facilitate examination, resetting and/or replacement without the need to disassemble or demount the associated device.

6. All circuit components shall be operated in full compliance with the manufacturer's recommendations and shall contain sufficient permanent identification to facilitate replacement.

2.2 SUBSTITUTE EQUIPMENT

A. Substitutions of equipment, beyond alternatives listed, will be permitted only if such equipment is listed in an addendum to this specification. Address requests for inclusion of substitutions to the Acoustical/AV Consultant. Accompany any request for substitution with laboratory-measured data proving the equivalence of the proposed substitute in quality and performance. The Acoustical/AV Consultant shall be the final judge of the validity of data submitted.

2.3 AUDIO & VIDEO EQUIPMENT COMPONENTS LIST

Audio & Video Systems shall include, but not be limited to the following:

Theater

Equipment Description	Manufacturer	Model No.	Qty.
Digital Audio Console	Roland	M-480	1
REAC Merge	Roland	S-4000M	1
Digital Snake Head 16/8	Roland	S-1608	3
Digital Snake Head 8/8	Roland	S-0808	1
Digital Snake Head 32/8	Roland	S-4000S-3208	1
REAC Wall I/O Plates	Custom	per dwgs.	3
48 Channel Recorder	Roland	R-1000	1
Stage Input Wall Frame	Whirlwind	WFS8x8x1B	4
Stage Input Insert Panel	Whirlwind	WFI8x8B	4
Insert Panel Custom Punchout	Whirlwind	per dwgs.	4
Stage Input Back Box	Whirlwind	BB8x8x4B	4
Powered Stage Monitors	JBL	PRX612M	3
Wireless Antenna Divider - Active	MiPro	AD-707a	10
Passive Antenna Divider	MiPro	AD-12	2
Diversity Fin Antenna	RF Venue	DFIN	1
Antenna Stand	K&M	201/2	1
Wireless Receiver Mount	Audio Technica	AT8628a	12
House Left/Right Speaker - Powered	Danley	SM96IP	2
House Center Speaker - Powered	Danley	SH95IP	1
House Subwoofer - Powered	Danley	TH112	1
Speaker DSP	Symetrix	Jupiter 4	1
Assisted Listening	Listen	LS-16-072-01	1
Additional ALS Receivers	Listen	LR-200-072	16
Additional ALS Ear Speakers	Listen	LA-164	16
Additional ALS Neck Loops	Listen	LA-166	3
Video Wall Plate Inputs	Crestron	DM-TX-200-2G	5
Video Switcher	Crestron	DPMS-200-C	1
Extended Range RF	Crestron	CEN-ERFGW-POE	1
Remote Control	Crestron	TST-600	1
Digital Media 8G+ Receivers	Crestron	DM-RMC-100-C	4
Video Projector	Epson	G6750WUNL	1
Projector Lens	Epson	ELPLM05	1
Projection Screen- 240"w x 150"h - 16:10	Draper	Stage Screen - Black Frame	1

Projector Mount	Peerless	PRG-UNV	1
Projector Column	Peerless	EXT 102	1
Column Pipe Attachment	Peerless	ACC600	1
Bluray Player	LG	BP340	1
Intercom Base Station	Clearcom	SB-704	1
Mic Stations	Clearcom	HB-704	5
Speaker Stations	Clearcom	KB-702	7
Wired Headsets	Clearcom	CC-300	6
Wireless Intercom Package	Clearcom	CZ11514	1
DSP/Amplifiers	Stewart Audio	FLX80-4	2
Ceiling Speakers	Atlas	FAP62t	8
FOH Rack	Middle Atlantic	PTRK-1426MDK	1
Stage Rack	Middle Atlantic	WRK-44SA-32-LRD	1
Control Room/Wireless Rack	Middle Atlantic	WRK-44SA-32-LRD	1
Rack Power Supplies	Middle Atlantic	PDS-615-R	1
Rack Power Supplies	Middle Atlantic	PDS-2x315R	2
Rack Power Strips	Middle Atlantic	PDT-2015C-NS	2
Rack Drawers	Middle Atlantic	UD3	Per Dwgs.
Rack Shelves	Middle Atlantic	OCAP-2	Per Dwgs.
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs.
Vent Rack Panels	Middle Atlantic	As Req'd	Per Dwgs.
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
AV Input/Output Plates		As Req'd	Per Dwgs.

Vocal/Orchestra Classroom & Instrumental/Band Classroom

Equipment Description	Manufacturer	Model No.	Qty.
Hanging Microphones	AKG	HM 1000 M	4
Microphone Capsules	AKG	CK41	4
Rack Mixer	Shure	SCM 262	2
Rack Recorder	Tascam	SS-CDR200	2
Wall Speakers	Tannoy	DVS 6	4
Amplifiers	Atlas	DPA-102PM	2
Priority Paging Controller	Atlas	AA-PPRC	2
Custom Rack Input Panel	Custom	per. dwgs.	2
Classroom Rack	Middle Atlantic	CFR-14-18	2

Rack Power	Middle Atlantic	PD-915R	2
Rack Drawers	Middle Atlantic	UD3	Per Dwgs.
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs.
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
AV Input/Output Plates		As Req'd	Per Dwgs.

Portable Recording System

Equipment Description	Manufacturer	Model No.	Qty.
Rack Mixer	Shure	SCM 800	1
Portable Rack	Middle Atlantic	PTRK-1426MDK	1
Custom Rack Input Panel	Custom	per. dwgs.	1
Rack Recorder	Tascam	SS-CDR200	1
Rack Power	Middle Atlantic	PD-915R	1

Commons F201B & F201A

Equipment Description	Manufacturer	Model No.	Qty.
Projection Screen - 16:10 177"x284" Matte White Screen w/ Low Voltage Control	Draper	Paragon/Series V	1
Projector	Christie	L2K1000	1
Projection Lens, 1.1-1.5:1 Zoom	Christie	103103101-01	1
Projector Bulb	Christie	003-120598-01	2
Projector Scissor Lift	Draper	SL with U Enclosure	1
Unistrut Scissor Lift Support	Unistrut	As Req'd	Per Dwgs.
Ceiling Speakers - Type S1	Atlas	FAP82T	21
Ceiling Subwoofer - Type S2	Atlas	FAPSUB-1	2
Upper Commons Amplifier	Stewart Audio	FLX320-1-CV	1
Lower Commons Amplifier	QSC	CX602V	1
Wireless Microphones	Shure	ULXS124/85	2
Wireless Antenna - Rack Mount	Shure	As Req'd	Per Dwgs
Wireless Antenna Combine	Shure	UA221	2
AV Switcher	Crestron	DPMS-200-C	1
AV Wall Input	Crestron	DM-TX-200-C-2G	1
Touchpanel Control	Crestron	TSW-550	1
Network Switch	Crestron	CEN-SW-POE-5	1
DM Receiver w/ Scaler	Crestron	DM-RMC-Scaler-C	1
CD/IPOD Player	Tascam	CD-200iL	1

Equipment Rack	Middle Atlantic	CFR-14-18	1
Power Strip	Middle Atlantic	PDS-615R	1
Rack Shelves	Middle Atlantic	OCAP-2	1
Rack Drawers	Middle Atlantic	UD2	1
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
AV Input/Output Plates		As Req'd	Per Dwgs.

Main B102 & Auxiliary B101 Gyms - Base Bid

Equipment Description	Manufacturer	Model No.	Qty.
Rack Mixer	Shure	SCM 800	2
Wireless Microphones	Shure	ULXS124/85	4
Antenna Rack Mount	Shure	As Req'd	Per Dwgs
CD/IPOD Player	Tascam	CD-200iL	2
1/8" Stereo Input Plates	Custom		6
Amplifier	QSC	CX602V	2
Speakers - Type S3	Atlas	PM8FA	20
Audio Combiners	RDL	STD	6
3-Channel Mixer	RDL	ST-MX3	2
Equipment Rack	Middle Atlantic	EWR-10-22-SD	2
Power Strip	Middle Atlantic	PDS-615R	2
Rack Drawers	Middle Atlantic	UD2	2
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
Stereo Input Plates and Cabling		As Req'd	Per Dwgs.

Weight/Fitness Room A103

Equipment Description	Manufacturer	Model No.	Qty.
Ceiling Speakers - Type S4	Atlas	FAP62T	8
Mixer Amplifier	Atlas	AA240	1
CD/IPOD Player	Tascam	CD-200iL	1
Equipment Rack	Middle Atlantic	EWR-10-22-SD	1
Fire Alarm Ducking Module	Atlas	AA-PPRC	1
Power Strip	Middle Atlantic	PD-915R	1
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs

Custom Rack Panels	As Req.d	Per Dwgs.
Plate and Panel Engraving	As Req'd	Per Dwgs.

Health Classroom A104

Equipment Description	Manufacturer	Model No.	Qty.
Ceiling Speakers - Type S4	Atlas	FAP62T	2
AV Switcher	Crestron	DPMS-100-C	1
Projector	Epson	4855WU	1
Projection Screen - 16:10, 65"x104"	Draper	Access/Series E	1
Projection Screen Low Voltage Control	Draper	As Req'd	1
AV Wall Input	Crestron	DM-TX-200C-2G	2
Wireless Microphone	Shure	BLX14R/W85	1
Wireless Mic Antenna Rack Mount	Shure	As Req'd	Per Dwgs
Bluray Player	LG	BP340	1
Touch Panel Control	Crestron	TSW-550	1
8G+ Receiver	Crestron	DM-RMC-100-C	2
Network Switch	Crestron	CEN-SW-POE-5	1
Rack	Middle Atlantic	ERK-1820LRD	1
Front Door with Lock	Middle Atlantic	FD-18 with Lock	1
Power Strip	Middle Atlantic	PD-915R	1
Rack Drawers	Middle Atlantic	UD3	1
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
AV Input/Output Plates		As Req'd	Per Dwgs.

Lecture Classrooms G302 & G303

Equipment Description	Manufacturer	Model No.	Qty.
Ceiling Speakers - Type S4	Atlas	FAP62T	4
AV Switcher	Crestron	DPMS-300-C	1
Projector	Epson	4855WU	2
Projection Screen - 16:10, 65"x104"	Draper	Access/Series E	2
Projection Screen Low Voltage Control	Draper	As Req'd	2
AV Wall Input	Crestron	DM-TX-200C-2G	4
Wireless Microphone	Shure	BLX14R/W85	2

Wireless Mic Antenna Amplifier	Shure	As Req'd	Per Dwgs
Touch Panel Control	Crestron	TSW-550	2
8G+ Receiver	Crestron	DM-RMC-100-C	2
Amplifier	Atlas	PA40G	1
Network Switch	Crestron	CEN-SW-POE-5	1
Rack	Middle Atlantic	EWR-1022SD	1
Power Strip	Middle Atlantic	PD-915R	1
Rack Drawers	Middle Atlantic	UD2	1
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
AV Input/Output Plates		As Req'd	Per Dwgs.

Main B102 & Auxiliary B101 Gyms Enhancement Alternate

Equipment Description	Manufacturer	Model No.	Qty.
Rack Mixer	Shure	SCM 262	2
Wireless Microphones	Shure	ULXS124/85	4
CD/IPOD Player	Tascam	CD-200iL	2
1/8" Stereo Input Plates	Custom		8
Amplifier	QSC	CX602V	2
Speakers - Type S3	Atlas	PM8FA	28
Equipment Rack	Middle Atlantic	EWR-10-22-SD	2
Power Strip	Middle Atlantic	PDS-615R	2
Rack Drawers	Middle Atlantic	UD2	2
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
Stereo Input Plates and Cabling		As Req'd	Per Dwgs.

Weight/Fitness Room B002 Enhancement Alternate

Equipment Description	Manufacturer	Model No.	Qty.
Ceiling Speakers - Type S3	Atlas	PM8FA	8
Mixer Amplifier	Atlas	AA240	1
CD/IPOD Player	Tascam	CD-200iL	1
Equipment Rack	Middle Atlantic	EWR-10-22-SD	1
Fire Alarm Ducking Module	Atlas	AA-PPRC	1

Power Strip	Middle Atlantic	PD-915R	1
Blank Rack Panels	Middle Atlantic	As Req'd	Per Dwgs
Custom Rack Panels		As Req.d	Per Dwgs.
Plate and Panel Engraving		As Req'd	Per Dwgs.
Stereo Input Plates and Cabling		As Req'd	Per Dwgs.

2.4 AUDIO & VIDEO CONNECTION DEVICES, WIRE AND CABLING

A. All wiring and cabling equipment and work shall be provide in accordance with the School District Field Services Specifications.

B. The following connection devices or acceptable substitutions shall be acceptable as required herein:

1. Circular Audio Connector (XLR type), Cord, with totally captive hardware:
   a. ADC.
   b. Neutrik.
   c. Switchcraft.
2. Circular Audio Connector (XLR type), Panel:
   a. ADC.
   b. Neutrik.
   c. Switchcraft.
3. General Purpose Multi-Pin (Over 5) Locking Connector:
   a. Whirlwind
   b. ITT Cannon AP series, EP series.
   c. VEAM (Litton) CIR series.
4. Circular Speaker Wire Connector (Speak-On type):
   a. Neutrik.
5. Din Rail Mount Terminal Blocks:
   a. Altech Corp.
   b. Acceptable substitution.

C. The following cable or acceptable substitutions shall be acceptable as required herein:

1. Digital Audio REAC
   a. Description: See Category 5 Cable description, below, or acceptable substitution by Roland Systems Group.
   b. Cable shall be terminated with EtherCON connectors.
2. Microphone/Line Level (General Purpose).
   a. Description: The cable shall be a PVC jacketed, shielded, single twisted pair, with 20 AWG stranded conductors and foil shield with drain wire. The cable shall be U.L. listed.
      1) Belden #8762
      2) Acceptable substitution by West Penn, Alpha or Liberty.
3. Multi-Strand Microphone (Snake or Fanout)

a. Description: The cable shall be a PVC jacketed, individually shielded, twisted pair cable with 22 AWG stranded conductors and foil shield with drain wire. Number of conductors in the cable shall be matched to the number of audio signals required. The cable shall be U.L. listed.
   1) Belden “Brilliance Broadcast” Analog Multi-Pair Snake Cable
   2) Acceptable substitution by West Penn, Alpha or Liberty.

4. Multi-Conductor Control.
   a. Description: The cable shall be a single jacketed type, containing twenty stranded conductors, 22 gauge.
      1) Belden 9431.
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.

5. Speaker Cable.
   a. Non-Plenum Description: The cable shall be two (2) conductor (twisted pair), jacketed, unshielded, 14 AWG or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #8473
      2) Acceptable substitution by West Penn, Alpha or Liberty
   b. Plenum Description: The cable shall be two (2) conductor (twisted pair), jacketed, unshielded, #14 or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Liberty # 14-2C-P
      2) Acceptable substitution by West Penn, Belden or Alpha.

6. Category 5 Cable
   a. Non-Plenum Description: The cable shall be four, two (2) conductor (twisted pair), PVC jacketed, unshielded, 24 AWG solid conductors. Cables shall be U.L. listed.
      1) Crestron Digital Media 8G
      2) Liberty #24-4P-L5-EN
      3) Acceptable substitution by West Penn, Belden or Alpha.
   b. Plenum Description: The cable shall be four, two (2) conductor (twisted pair), PVC jacketed, unshielded, 24 AWG solid conductors. Cables shall be U.L. listed.
      1) Crestron Digital Media 8G
      2) Liberty #24-4P-P-L5-EN
      3) Acceptable substitution by West Penn, Belden or Alpha.

7. Category 6 Cable
   a. Non-Plenum Description: The cable shall be four, two (2) conductor (twisted pair), PVC jacketed, unshielded, 24 AWG solid conductors. Cables shall be U.L. listed.
      1) Liberty #24-4P-L6-EN
      2) Acceptable substitution by West Penn, Belden or Alpha.
   b. Plenum Description: The cable shall be four, two (2) conductor (twisted pair), PVC jacketed, unshielded, 23 AWG solid conductors. Cables shall be U.L. listed.
      1) Liberty #24-4P-P-L6-EN

      Acceptable substitution by West Penn, Belden or Alpha.

8. Video, VHF/UHF Cable (70 Ω).
   a. Non-Plenum Description: The cable shall be one, solid conductor, high resolution coaxial cable. Cables shall be U.L. listed.
      1) Belden #1505A
      2) Acceptable substitution by West Penn, Alpha or Liberty.
   b. Plenum Description: The cable shall be one, solid conductor, high resolution coaxial cable. Cables shall be U.L. listed.
      1) Belden #1506A

2) Acceptable substitution by West Penn, Alpha or Liberty.

9. RGBHV Cable.
   a. Description: The cable shall be one, five solid conductor, high resolution coaxial cable made of 25 AWG conductors or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #1279R
      2) Acceptable substitution by West Penn, Alpha or Liberty.
10. RF Cable (50 Ω).
   a. Description: The cable shall be coaxial RG-8.
      1) West Penn #810
      2) Acceptable substitution by West Penn, Alpha or Liberty.
11. Communications Cable.
   a. Description: The cable shall be four, 2 conductor (twisted pair), jacketed, individual shielded, 24 AWG or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #8164
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.
12. Remote Power Switch Cable.
   a. Description: The cable shall be two, 2 conductor (twisted pair), jacketed, shielded, 22 AWG or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #5541FE
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.
13. Power Control Cable.
   a. Description: The cable shall be two conductor (twisted pair), jacketed, shielded, 22 AWG or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #8761.
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.
14. Low Voltage DC Power Cable.
   a. Description: The cable shall be two (2) conductor (twisted pair), jacketed, unshielded, 16 AWG or larger to meet loss criteria. Cables shall be U.L. listed.
      1) Belden #8471.
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.
15. S-Video
   a. Description: The cable shall be two (2) conductor, 75 ohm, 30 AWG stranded tinned copper center conductors with tinned copper shield and PVC jacket. Cables shall be U.L. listed.
      1) Belden #1808A
      2) Acceptable substitution by West Penn, Alpha, Extron or Liberty.
16. Digital Video, HDMI Cable
   a. Non-plenum Description: The cable shall be on High Speed cable. Cables shall be U.L. listed.
      1) Extron # HDMI Pro
      2) Acceptable substitution by DVI-Gear, Liberty or Belden

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall coordinate this work with the other electrical work and the work of other trades.

B. Perform the work of this section in accordance with acknowledged industry and professional standards and practices, and the procedures specified herein.

C. Provide all materials, devices, components, and equipment required for complete, operational systems.

D. A designated field supervisor shall be present on the job site and in responsible charge during all phases of installation and checkout. This supervisor shall be the same individual through the execution of the work unless illness, loss of personnel, or other circumstances beyond the control of the Contractor intervene.

3.2 SYSTEM INSTALLATION RESPONSIBILITY

A. The Installing Contractor is responsible for providing a fully functional system that incorporates the new as well as any existing equipment.

3.3 SYSTEM FUNCTIONS AND CONTROL

A. System Functions

1. SYSTEM TO REMAIN TURNED OFF AND UNAVAILABLE FOR OWNER USE UNTIL FINAL COMMISSIONING AND OWNER TRAINING HAS TAKEN PLACE. Owner operation of a partially complete or non-equalized system shall not be permissible.

B. Control Features

1. The user interface is to be no more than two menu layers deep for any requested function. Access to basic system commands, including, but not limited to, system on/off, audio volume, video routing select and teleconference system dialing shall be no more than one menu page deep. More complex commands, including DVR/VCR transport controls and individual microphone volumes may be up to two layers deep in the menu structure. The control system interface will be developed with input from the end user.

2. Control system user interfaces pages shall be designed for this project exclusively. While there are a great number of design approaches to designing the user interface, the following guidelines shall be adhered to:

    a. All panels shall have consistent labeling of (font, capitalization, size, color) buttons and pages.
    b. All panels are to have a title, indicating the piece of equipment and/or functionality being controlled.
    c. Final programming shall include capability to remotely control all functions of the audiovisual system via network "virtual touch panel" interface.
    d. Individual device transport, etc. controls shall provide full manufacturer’s functionality.
    e. Devices similar in nature shall be programmed to operate with a common format.
    f. No individual component shall be programmed to function atypically.
    g. Whenever the same button appears on more than one page, it will be in the same position on each page.
    h. Functions used during a general presentation shall be accessible with a minimal amount of button presses, pop-up windows.
    i. Where feasible, multi-level access to system controls should be avoided.
    j. Password protected setup pages are required for non-typical user control access.

k. All school logos, primary school colors, secondary school colors shall be incorporated into the touch panel design.

l. Sample touch panel pages shall be submitted to the AV consultant using the above design criteria, for approval before final installation. The submittals may be provided as a series of screen shots, or as a functional touch panel "emulation" file authored in a program such as AMX G4 PanelPreview.

3. Software Documentation: Actual source code must be provided. The Owner shall be granted a license in perpetuity for use. The following requirements shall apply:

a. All source code becomes the property of the Owner.

b. All source code changes must be fully documented.

c. All source code files must be uploaded to the system controller, and must not be password protected, for future extraction as necessary.

d. All custom programs for remote control system touch panels, and other programmed devices, shall become the property of the Owner, and is submitted with the final systems documentation in the CD-ROM. A copy of the current program shall be kept with the “as-built” drawings, in a protective envelope.

e. The Owner reserves the right to re-use and modify the source code as necessary for systems installed under this contract or any future systems yet to be deployed.

f. Subsequent to system certification, source code changes and/or additional programming, whether requested by the client or performed by the vendor, will be warranted by the vendor for a period of one (1) year, with the vendor responsible for the diagnosis and repair. The vendor shall ensure that the current program is saved to a CD-ROM, and stored as outlined.

g. No program resident in a control system shall be overwritten until a back-up of the resident program is made.

h. An acceptance test will be performed for a ten (10) day period, during which this changed or additional code must perform accurately and error free.

3.4 WIRE AND CABLE

A. Classification:

1. All wiring specified herein shall be installed in accordance with standards established for the respective classification.

2. Audio signal wiring classifications:
   a. Type AI: Microphone level wiring less than -30 dBV, 20 Hertz to 20 Kilohertz.
   b. Type A2: Line level wiring -30 dBV to +22 dBV, Hertz to 20 Kilohertz.
   c. Type A3: Loudspeaker level or circuit wiring greater than +22 dBV, from 20 Hertz to 20 Kilohertz.
   d. Type A4: Radio Frequency (RF) Modulated audio signal.

3. Video and related signal wiring classification:
   a. Type VI: Baseband and composite video wiring 0 to 2 volts peak-to-peak into 75 ohms, 0 Hertz to 10.0 Megahertz.
   b. Type V2: Synchronization and switching pulse wiring to 4 volts peak-to-peak into 75 ohms, 3.57 to 4.43 Megahertz.
   c. Type V3: Color subcarrier wiring 0 to 4 volts peak-to-peak into 75 ohms, 3.57 to 4.43 Megahertz.

d. Type V4: Radio Communication system wiring 0.1 to 1000 uV peak-to-peak into 50 or 75 ohms, 47 to 890 Megahertz.

4. Control signal wiring classifications:
   a. Type C1: Sound Control System serial control bus, less than 12 volts RMS.
   b. Type C2: Serial Control Communication, less than 12 volts RMS.
   c. Type C3: DC control wiring 0 to 50 volts.
   d. Type C4: AC control wiring 0 to 48 volts, 60 Hertz.
5. Additional wiring classifications:
   a. Type P1: DC power wiring 0 to 48 volts.
   b. Type P2: AC power wiring greater than 50 volts, 60 hertz

B. Practice:

1. Notwithstanding requirements elsewhere in these specifications, the following wiring combinations are acceptable in conduit, or cable harnesses:
   a. Types A1, C3, and P1.
   b. Types A2, C1, C2, C3, and P1.
   c. Types A3, C1, C2, C3, and P1.
   d. Types A2, V1, and V4.
   e. Types V1, V3, V4, C3 and P1.
   f. Types C4 and P2.
   g. Types V2.
   h. Types A6.
2. Except as indicated herein, conduit, wireways and cable bundles shall contain only wiring of a single classification.
3. All electronic equipment interconnection wire and cable shall be continuous and splice-free for the entire length of run between designated connections or terminations.
4. All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels or equipment enclosures. Tin the terminated shield drain wires and insulate with heat shrinkable tubing.
5. Land all non-coaxial wiring entering each equipment rack at terminal devices prior to connection to any equipment or devices within. Separately dress, route and land microphone and line level cables prior to connection to any equipment or devices within. Dress, route, and land loudspeaker level, video and control cables at screw or tubular clamp type barrier blocks on the left side of the equipment enclosure, as viewed from the rear, or in designated terminal enclosure, prior to connection to any equipment or devices within.
6. Make all connections to screw-type barrier blocks with insulated crimp-type spade lugs. Size all lugs properly to assure high electrical integrity, i.e., low resistance connections.
7. Use only rosin core 60/40 or 63/37 tin/lead solder for all solder connections.
8. Lace, tie, or harness wire or cable as required herein, and in accordance with accepted professional practice. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections; no wire or cable shall be supported by a connection point. Provide service loops where harnesses of different classes cross, or where hinged panels or extendable rack rails are encountered.
9. Correct any and all of the following unacceptable wiring conditions:

a. Deformed, brittle or cracked insulation.
b. Insulation shrunken or stripped further than 1-inch away from the actual point of connection within a connector, or on a punch block.
c. Cold solder joints.
d. Flux joints.
e. Solder splatter.
f. Ungrommeted, unbushed, or uninsulated wire or cable entries.
g. Deformation or improper reducing of wire or cable, especially coaxial cable.
h. All unused or unspecified device inputs and outputs shall be accessible at the adjacent patch bay.

10. Audio signal connector convention: IEC Standard No. 268, part 12 (1975); Circular Connectors for Broadcast and Similar Use.

Signal	Connector	Wire
Signal Phase	Pin 2	Red or White
Signal Anti-Phase	Pin 3	Black
Signal Ground	Pin 1	Drain Wire

C. Installation:

1. Verify that all conduits has been de-burred and properly joined, coupled, and terminated prior to pulling of cables.
2. Inspect all conduit bends to ensure proper reducing, in accordance with recommendations of the wire, cable or conduit manufacturer; in no case shall the radius be less than twelve (12) times the conduit diameter.
3. Verify that all conduit is clear of foreign matter and substances prior to pulling of wire or cable.
4. Provide permanent identification of run origination at all conduit terminations.
5. Apply a chemically inert conduit lubricant to all wire and cable prior to pulling. Do not subject wire and cable to tension greater than that recommended by the manufacturer. Under no circumstances shall wire or cable be "jerked" through conduit.
6. Provide a box loop for all wire and cable routed through junction boxes or distribution panels. Cable loops and bends shall not be bent at a radius greater than that recommended by the manufacturer.
7. Identify all wire and cable clearly with permanent labels wrapped about the full circumference within one (1) inch of each connection. Indicate the number designated on the associated field or shop drawing or run sheet, as applies. Assign wire or cable designations consistently throughout a given system; i.e., each wire or cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations. Additionally provide labels where wire and cable first enter and exit from conduit, junction, or distribution boxes; labels shall be located within six (6) inches of the point of entry or exit. Labels shall be by Thomas and Betts, Panduit Insta-code, or computer generated and printed custom. Protect all wire markers with clear heat-shrink tubing, Alpha or equal.
8. Secure all wire and cable run vertically in conduit for continuous distances greater than thirty (30) feet at the vertical run terminations. Non-coaxial cables shall be secured by screw-flange nylon cable ties or similar acceptable substitution devices, Thomas and Betts or equal. Symmetrical conforming, nonmetallic bushings shall be provided for all other cables. Support racks shall be Unistrut or Kindorf.

9. Wiring in terminal cabinets shall be tied and clamped neatly to backboards or cableforms.

10. All audio, video, patch bay and control wiring shall be bundled, laced or tie-wrapped and routed in a manner consistent with broadcast industry and SMPTE standards. All cable jacket insulation exit points shall be dressed with a short section of opaque heat-shrink tubing.

11. All audio or control connections employing crimped or soldered spade lugs shall have the shank portion protected and covered by a short length of opaque heat-shrink tubing.

12. Maintain consistent absolute signal polarity at all connectors, patch points and connection points accessible in the system. Where applicable, a positive polarity electrical signal shall yield positive acoustic pressure from the loudspeakers.

13. All AC power cords shall be shortened or specified shortened to a length appropriate to the task. Bundled or tie-wrapped AC line cords are not acceptable.

14. Terminals shall, unless otherwise specified, be one of the following types:
    a. Phoenix type terminal block
    b. Barrier strips with screw terminals

3.5 BOX, PANEL, AND ENCLOSURE INSTALLATION

A. All boxes, panels, and enclosures shall be installed square and plumb. Flush mounted units shall be set so that the face of the cover, bezel, or escutcheon shall be in the same plane as the surrounding finished surface. Boxes, panels, and trim shall be mounted so that there are no gaps, cracks, or obvious lines between the trim and the adjacent finished surface, and shall be readied to receive final paint.

B. Access panels shall be provided where needed to access boxes, panels and enclosures in walls or ceilings, and shall be indicated and dimensioned on the shop drawings. Panels shall be finished to match the adjoining surfaces.

C. All wall mounted input, output and control panels shall be mounted with finish quality, Phillips or hex type, flat or oval steel machine screws of an appropriate length and color.

D. Steel frames and enclosures shall be designed and wired to eliminate all induced currents within both the units and the systems. All bolted connections shall be made with self-locking devices.

E. Recessed panels shall be contained within formed steel back boxes; operating panels shall be recessed within the back box to a depth sufficient to permit a locking hinged panel cover to completely close without affecting any device within that enclosed area.

F. Semi-recessed and surface mounted control panels shall be contained within steel back boxes at least 0.040 inch thick, with all seams and joints continuously welded. Operating panel mounting considerations shall be the same as those for recessed panels.

3.6 EQUIPMENT AND EQUIPMENT RACK INSTALLATION

A. All electronic equipment of sufficient weight or depth shall be mechanically supported by equipment rack rear mounting rails unless noted otherwise.

B. All electronic equipment shall be mounted in the equipment rack with finish quality, black oxide, hex type, flat, oval or button head 10-32 steel machine screws of an appropriate length. All equipment front panel rack attachment points shall be protected with a suitable black, nylon cup or flat washer (screw type dependent) commensurate with the mounting machine screws.

C. Provide full-height multi-circuit ISOLATED GROUND modular power raceway system/s with not less than the required number of outlets for each piece of equipment in equipment racks. The outlet strip/s and box shall be electrically continuous within the rack, mounted near the left and

right framing members as needed, as viewed from the rear of the rack. Bring 120VAC power into the racks for any Sequenced Power Distribution devices. Properly protect the connection to prevent accidental injury.

D. Provide a switch operated equipment rack lamp assembly in the top of all equipment racks. The lamp assembly should be sized appropriate and sufficient to illuminate the rear of each rack for normal maintenance operations. The lamp should be sufficiently protected to prevent breakage during normal equipment servicing and maintenance operations. Residential type pull chain switch lamp fixtures are not acceptable.

E. Provide each equipment rack with a locking rear door including retaining devices and protective plastic covers for run sheets, rack elevation and single line drawings.

F. Provide matching black anodized brushed aluminum blank panels in all spare rack spaces, and matching ventilation-type front panels between power amplifiers unless indicated otherwise in the drawings. Provide a spare rack "blank panel kit" consisting of two (2) each of 1, 2, 3 & 4 rack space solid panels and two (2) each 1 space vent panels with a small quantity of rack screws, washers and hex wrench. The "blank panel kit" panels should be of the same type, color and finish as the supplied system panels.

G. Provide a fan assembly in each rack where shown on the drawings. Coordinate airflow direction with power amplifier manufacturer.

H. Key each grouping of equipment racks identically, with the appropriate designation stamped into each associated key, as indicated on the shop drawings.

I. Provide access covers, hinged panels, or pull-out drawers to insure complete access to terminals and interior components. In no case shall such access require demounting or de-energizing of same, or adjacent, equipment.

J. Fasten removable covers containing any wired component with a continuous hinge along one side, with associated wiring secured and dressed to provide an adequate service loop. Appropriate stop locks shall be provided to hold all hinged panels and drawers in a serviceable position.

K. Provide a permanent label on the front of each equipment rack identifying the rack function and number (i.e., Stage, etc.) as assigned and referenced consistently throughout this project. Each label shall consist of 1/16 inch (minimum) thick laminated plastic labels with engraved characters at least 1-inch high (White characters on Black background) fastened to the equipment by screws, rivets or permanent adhesive backing.

L. Provide all rack-mounted equipment, devices, and materials specified herein in the respective equipment racks in a logical, functional manner, demonstrative of signal flow within the respective system or as defined on the proposed equipment rack elevations.

M. Group all microphone-level, line-level, video, control circuit patching not associated with adjacent equipment, respective of the associated signal circuit classifications. The latter patching facilities shall be positioned as shown on the drawings.

N. Unassigned devices and equipment as herein scheduled shall be located in equipment rack positions as shown on drawings.

O. Provide a minimum of three (3)-foot clearance behind all fixed equipment racks, and three (3)-foot clearance in front, unless specifically shown otherwise on drawings.

P. Shop test wired racks and submit test report prior to delivery of racks to Project site.

3.7 FINISHES AND IDENTIFICATION

A. Finishes and materials for contractor fabricated assemblies such as Sound racks, custom control panels, brackets, blank panels, equipment mounting in furniture or casework, speaker baffles,

speaker grille material and in general any item or component herein which is visible shall adhere to the following:

1. All steel surfaces shall be treated with zinc phosphate and finish painted with baked enamel or painted with thermosetting epoxy paint.
2. All aluminum surfaces, except those used as operating surfaces, shall be brushed and anodized or painted with thermosetting epoxy paint.
3. Finish colors shall be as indicated in Contract Documents or as selected by the Architect.
4. NO plates, panels, or other hardware mounted in equipment racks shall be white or ivory. White or Ivory colored equipment may be acceptable if the manufacturer does not provide a different color. Determination and acceptance shall be made by the Acoustical/AV Consultant.

B. Identification:

1. Provide permanent intelligible identification on, or adjacent to, all controls, fuses, circuit breakers, relays, connectors, receptacles and the like. This identification shall clearly and distinctly indicate the function of the item and shall be numbered or lettered to correspond with the function, circuit and location consistent with field and shop drawings.
2. Identification of fuses and circuit breakers shall indicate protected circuitry, rating of protective device.
3. All specified equipment, custom and contractor fabricated equipment rack panel surfaces shall be engraved and filled or silk screened with identification and function legends. All provided audio, video and control equipment shall be identified by function (i.e., Amplifier, Pre-Amplifier, LD VDA, VCR ADA, etc.) also included shall be identification for all relevant controls (i.e., Left Channel, Mic 1, etc.) with 1/16 inch thick laminated plastic labels with engraved characters at least 1/4 inch high (white characters on black background) fastened to the equipment by screws or permanent adhesive backing. Under no conditions will embossed plastic labels be considered acceptable.
4. Each principal element of the system shall be completely wired internally with consistently identified terminal strips provided for all connections. These designations shall be shown on all related drawings and documentation.

3.8 SIGNAL GROUNDING PROCEDURES

A. Unless otherwise noted maintain a unipoint ground scheme (provided under Division 26, coordinated with Division 11).

B. Signal and electrical system grounds shall be isolated except at the local Isolated Ground distribution panel or project ground field connection (provided under Division 26, coordinated with Division 11).

C. Equipment enclosures shall not be permitted to touch each other unless bolted together.

D. All equipment enclosures and racks shall be connected to Raceway Ground by a single, green insulated #4 TW stranded wire.

E. Each ensemble of racks shall include a single labeled Raceway Ground tubular-clamp bus bar terminal strip to land the individual labeled rack grounds.

F. At each rack, provide a lug bonded to the rack frame with a bare #4 TW stranded wire to the Isolated Ground Bus.

G. Equipment signal ground shall be to the Isolated Ground System via the green wire of the equipment power cord. Where equipment uses two (2) wire power cord, provide green bond wire to rack IG bus bar, gauge equal to equipment main's power supply conductors. Technical power

grounding scenarios are further described in the electrical distribution drawings.

H. Shielded cables of this section shall be grounded exclusively to Isolated Ground.

I. Cable shields shall be grounded by a single path.

J. Shield shall be tied to Isolated Ground at one end only, i.e., at the low potential (receiving) end of run, unless otherwise noted.

K. Unless otherwise noted, at audio jackfields, tie shield at jackbay frame and float opposite end. Bus each row of jack frames and run individual ground wire for each row to rack IG bus bar.

L. Signal Ground provisions shall realize less than 0.15 ohms from the load point to the primary ground connection.

3.9 LOUDSPEAKER ASSEMBLY INSTALLATION

A. All equipment except portable equipment shall be held firmly in place with a Safety Factor of at least five (5).

B. Provide positioning and support elements for loudspeaker assemblies. All such provisions shall attach to and wholly reside within the areas designated for same. Loudspeaker assemblies shall not be supported by the ceiling system alone.

C. Verify that no loudspeaker assembly is subjected to stresses or loading effects in any way contributing to extraordinary failure.

D. Correct all conditions giving rise to noise, rattle, vibration or other extraneous sounds owing to operation of a loudspeaker assembly under maximum performance operating conditions.

E. Coordinate installation of all boxes and conduit serving loudspeaker assemblies.

3.10 DEFINITIONS AND CONVENTIONS

A. Definition of Terms:

1. The following definitions and conditions apply to each of the respective parameters and the measurements of those parameters, unless specifically stated otherwise.

2. Frequency Response: The minimum acceptable frequency band over which the amplitude response is within 3dB (or any specified range), or the specified limits of the response relative to the reference frequency (1 kHz for audio) under design load conditions, at any operating level up to and including the specified maximum output while fully in compliance with all other performance specifications.

3. Maximum Output Level: The maximum acceptable signal output level (voltage, current, or power) attained under design load conditions while fully in compliance with all other performance specifications.

4. Harmonic Distortion: The maximum acceptable harmonic distortion measured at any operating level, up to and including the specified maximum output, with an applied sine wave signal of any frequency in the range of the specified frequency response.

5. Audio Intermodulation: The maximum acceptable intermodulation distortion resulting from the introduction of 60 Hz and 7 kHz signals in a ratio of 4:1 under design load conditions at any operating level up to and including the specified maximum output level.

6. Signal-to-Noise Ratio: The minimum acceptable ratio of signal-to-noise levels derived from broadband measurements under design load at maximum output over the entire range of the specified frequency response.

7. Clipping Level: The minimum acceptable maximum level of signal applied to the device under design load conditions while fully in compliance with all other performance specifications.

8. Sensitivity: The maximum acceptable level of input signal applied to the device that is necessary to provide the maximum output under design load conditions.

9. Design Load: The load (in ohms) specified by usage of the particular device input or output.

B. Signal Levels:

1. The following voltage or power levels shall be considered the standard operating levels for the particular circuitry, unless specifically noted otherwise (0 dBV = 1.0V):

a. Microphone Circuits: -30 DBV or less

b. Audio Line Level Circuits: -30 DBV to +12 DBV

c. Loudspeaker Level Circuits: More than +12 DBV

d. Video Level Circuits: 1V to 4V p-p

C. Characteristic Impedances:

1. The following operating impedance shall be considered to be the standard operating impedances for the particular circuitry, unless specifically noted otherwise:

a. Microphone Circuits: 50-250 ohms source, 150-1500 ohms terminating, electrostatically and electromagnetically balanced to ground.

b. Audio Line Level Circuits: 600 ohms maximum source, minimum terminating, line-to-line, electrostatically and electromagnetically balanced to ground.

3.11 PRELIMINARY CHECKS AND SYSTEM ENERGIZING

A. Conduct preliminary checks and testing prior to performance testing and subsequent to completion of related or adjacent work of other trades. Verify safe and proper operation of all components, devices, or equipment, nominal signal levels within the systems and the absence of extraneous or degrading signals.

B. Perform the following verification and/or testing procedures:

1. Proper grounding of devices and equipment.

2. Integrity of signal and electrical system ground connections.

3. Proper provision of power to devices and equipment.

4. Integrity of all insulation, shield terminations and connections.

5. Integrity of soldered connections.

6. Absence of solder splatter, solder bridges, debris of any kind, tools, etc.

7. Proper routing and dressing of wire and cable.

8. "Wire-checking" of all circuitry, including polarity and continuity, with reference to cable designations on running sheets, field and shop drawings.

9. Mechanical integrity of all support and positioning provisions, i.e. loudspeaker assemblies, etc.

10. Proper polarity and connection of loudspeaker assemblies.

11. Measurement and documentation of all loudspeaker circuit impedances.

C. Determine the proper sequence of energizing systems to minimize the risk of damage.

D. After successfully energizing the systems, make all preliminary adjustments and document the setting of all controls, parameters of all corrective networks, voltages at key system interconnection points, gains and losses, as applicable. Tabulate all data along with an inventory of test equipment, a description of testing conditions, and a list of test personnel, as itemized below. Copies of preliminary test data shall accompany copies of performance testing data as part of the final submittal.

E. Verify the performance parameters of the individual systems following established professional procedures, in addition to those specified herein.

F. Document all acceptance testing, calibration and correction procedures, in addition to those specified herein.

1. Date of performance of the given procedure.
2. Type of procedure, and description.
3. Conditions of performance of procedure.
4. Parameters measured and their values, including values measured prior to calibration or correction, as applicable.
5. Parameters associated with calibration or corrective networks, components, or devices.
6. The names of personnel conducting the procedure.
7. The equipment used to conduct the procedure.
8. Provide permanent "wedge" type labels on all controls, as applies, to indicate correct settings after performance testing and adjustment procedures have been successfully completed.

3.12 TESTING

A. Equipment: Provide at least one (1) each of the following items (or acceptable substitution):

1. Wide Band Oscilloscope suitable for NTSC Video and timing signals.
2. Pink Noise Generator (Ivie IE-20B or equal).
3. Digital Volt-Ohm-Multimeter (Fluke or equal).
4. Real Time Audio Spectrum Analyzer, One-Third Octave (Techron TEF 20 with software or equal).
5. Acoustic Polarity Tester (Sounder or equal).
6. Harmonic Distortion Analyzer (Sound Technology or equal) or Swept Spectrum Analyzer.
7. Low Distortion Audio Frequency Sine Wave Oscillator (HP or equal).
8. Calibrated Microphone and Pre-Amplifier Assembly (B&K, Ivie or equal).
9. All required adapters, cables, connectors, etc.
10. Any other items of test equipment or materials required to ensure conformance with the performance specifications.
11. Maintenance and Storage: Furnish, store and maintain test equipment at the job site for both routine and performance testing of this work. Maintain test equipment at the job site until system acceptance of this work; thereafter remove all of this test equipment from the job site.

B. Conduct all necessary performance testing; adjustment, and documentation procedures to verify

and realize compliance with the performance specifications herein. Make available at least one (1) technician familiar with this work, and all required test equipment for the duration of performance testing verification.

C. Written Report: Prepare a written report presenting the results of these tests, including numerical values and/or graphs where applicable. Submit report to Acoustical/AV Consultant through the Architect prior to demonstration and acceptance testing

D. Audio System Tests:

1. Upon completion of the installation of all equipment, and when same is in full operating condition, the Contractor shall perform the initial post completion tests and adjustments as specified hereinafter. Except as otherwise specified, this Contractor shall provide all instruments, equipment, labor and materials necessary to complete the tests.

2. Individual Equipment Items: Test, measure, adjust and document the performance of each individual item of equipment provided herein to demonstrate that it equals or exceeds manufacturer's published specifications or the specific applicable portion of these specifications, as applies. Specifically, examine frequency response, total harmonic distortion and signal-to-noise ratio. Replace any components found to be defective.

3. Loudspeaker line impedance: The Contractor shall measure the impedance and the resistance of each loudspeaker line leaving the racks (with the line disconnected from its normal driving source). The absolute value of impedance shall be measured at 200 Hz and 2 KHz. Maintain values within +10% of the value calculated for that circuit based upon the parallel impedances of the loudspeakers connected plus the resistance of the loudspeakers.

4. Hum and noise level: The hum and noise level of the overall shall be measured for each microphone input channel and line-level input channel. Gain controls shall be adjusted for optimum signal-to-noise ratio and such that full amplifier output would be achieved with -40 dBm input level at a microphone input and +12 dBm at a line-level input. Microphone and line-level inputs shall be terminated with shielded resistors of 150 and 600 ohms, respectively, for these measurements. The loudspeaker lines shall be disconnected and the power amplifier outputs shall be terminated with power resistors for these measurements. The value of the load resistors shall be equal to the nominal output impedance of the amplifier under test with 10% tolerance of the resistance.

5. Freedom from parasitic oscillation and radio frequency pickup: With systems set up for each mode of operation specified in the functional requirements, the contractor shall check to ensure that all systems are free from spurious oscillation and radio-frequency pickup and shall correct any such defects.

6. Loudspeaker Polarity: Polarity checks of loudspeaker lines shall be performed by means of an Acoustic Polarity Tester as specified herein. All loudspeaker lines shall be identically polarized with respect to color coding such that absolute polarity is maintained as specified elsewhere herein.

7. Freedom from buzzes, rattles and objectionable distortion: The Contractor shall apply a slow sine wave sweep from 50 to 5000 Hz at a level of 6 dB below rated power amplifier output voltage, to each system. The Contractor shall listen carefully for buzzes, rattles and objectionable distortion (each major loudspeaker zone shall be tested individually). The Contractor shall correct any causes of these defects, unless the cause is clearly outside the Sound amplification system equipment and installation in which case the cause shall be brought to the attention of the Construction Manager.

8. Gain control settings: The contractor shall establish tentative normal settings for all gain controls and measure system gains at 1 KHz. All gain controls on rack-mounted equipment shall be adjusted for optimum signal-to-noise ratio and signal balance and, unless they are

sub-panel mounted; they shall then be capped to prevent tampering. Unless specified or instructed otherwise, adjust gains such that in a given system the "front end" maintains 10 dB of clip margin referenced to the first onset of clipping of the associated power amplifier(s).

9. Power Output and Signal Level Adjustments: Measure the electrical distortion of the overall system. Adjust gain controls as for the hum and noise level test. Set variable equalizers for flat response. Apply 1000 Hz sine wave signal at the input tested, at a level required to produce a full amplifier output. Use a distortion analyzer to measure the output level and total harmonic distortion of the amplification equipment. Make all measurements with loads actually incurred in system operation. Power amplifier loads shall be resistors equal to the nominal impedance of the loudspeaker loads used in the system.

10. Freedom from Switching Transient Noise: Operate all control switches and relays, while listening for clicks and pops in the system outputs. Eliminate any found.

11. Listening Test: Listen to normal program material to be sure that there are no remaining defects.

E. Electro/Acoustic Tests:

1. Uniformity of coverage; utilize a source of octave-band pink noise centered at 1,000 and 4,000 Hertz, with representative measurements made at ear-level throughout the specified coverage area.

2. Electronic and acoustic frequency response/one-third octave equalization; refer to International Electrotechnical Commission Recommendations No. 179 and 225, and Altec Bulletin AL-1043.

3. Maximum continuous Sound pressure level (in the reverberant field); utilize a source of octave-band pink noise centered at 1000 Hertz, measure at ear-level on loudspeaker axis. Sustain for at least five minutes with no system damage.

4. Acoustic signal-to-noise ratio referenced to the specified maximum continuous Sound pressure level in the reverberant field; utilize a source of octave-band pink noise, centered at 1,000 Hertz, with mechanical systems off.

5. Acoustic gain before feedback; refer to Altec Bulletin AL-1968. Locate acoustic source (loudspeaker/pink noise generator) two feet from microphone. Measure at most distant listener position at ear-level.

F. Video System Tests

1. Frequency Response: Apply a multi-burst signal to each video input line terminated in a 75 ohm load. In case of inputs that are connected to runs of cable, test while using the full runs of cable. Frequency response from 500 kHz to 4.2 MHz shall not deviate more than + 0.5 dB.

2. Freedom from Parasitic Oscillation and Radio Frequency Interference: Check to ensure that the system is free from spurious oscillation and radio frequency interference, both in the absence of an input signal (input terminated in a 75 ohm load), and also with a staircase input of 100 IRE units peak amplitude. Employ an oscilloscope as specified. Test each video input including appropriate cable runs.

3. Hum: Apply a cross-hatch (grating) signal to each video input. With an oscilloscope and video monitor, check for the effects of 60 Hz interference. Eliminate any defects found.

4. Viewing Test: Apply EIA split field color bars to an input of the video projector. Adjust hue and saturation controls for optimum picture quality and colorimetric uniformity. Route program material from a computer, DVD, and VHS player to the projector. Watch for ghosting and any effects of excessive VSWR. Correct any defects found.

5. Video Projector Alignment: Align the video projector for optimal focus and horizontal and vertical linearity with a cross-hatch signal applied to the video projector.

G. Operational Tests:

1. Demonstrate all system functions as described in Parts 1.05 and 3.03.

3.13 AUDIO SYSTEMS PERFORMANCE REQUIREMENTS

A. Sound Systems:

1. Electrical Performance; Source Input to Power Amplifier Output.
   a. Frequency Response (Equalizer flat): ±0.5 dB 30 Hz to 15 KHz.
   b. Total Harmonic Distortion (THD): Less than 0.5%, 30 Hz to 15 KHz, +4 dBm line level.
   c. Signal to Noise: At least 75 dB, 30 Hz to 15 KHz, referenced to input of +4 dBm.
   d. Crosstalk: At least -70 dB, 30 Hz to 15 KHz.
2. Electro/Acoustic Performance, Central Loudspeaker Array:
   a. Uniformity of Coverage: ±5 dBA over audience area.
3. Frequency Response:
   a. On axis: ±2 dB, 40 Hz to 15 KHz.
   b. Overall: ±3 dB, 30 Hz to 18 KHz.
4. Acoustic Signal to Noise: At least 75 dB.
5. Acoustic Gain: At least unity.

3.14 FINAL PROCEDURES

A. Perform any and all remedial work, at no expense to the Owner to correct inadequate performance or unacceptable conditions, or to correct any of the work of this Section, as determined by the Architect or Acoustical/AV Consultant.

B. Furnish all portable equipment to the Owner’s Representative along with complete documentation of the materials presented. All portable equipment shall be presented in the original manufacturer's packing, complete with all included instructions and miscellaneous manuals and documents processed in accordance with the Guarantee provisions, as described herein before.

C. Present, review and clarify all materials to the Owner's Representative and/or Owner's staff operating personnel, as required under the provisions of Final Submittals, and fully demonstrate in an scheduled training session of a minimum of 6 hours in length the operation maintenance of the systems, equipment, and devices specified herein.

D. Check, inspect, and, if necessary, adjust all systems, equipment, devices, and components specified, approximately sixty (60) days after acceptance of the work in this section and again at 11 months. Make necessary changes, and, or adjustments end user requests during this period.

3.15 DEMONSTRATION AND ACCEPTANCE OF WORK

A. Upon completion of installation contractor shall notify Architect and Acoustical/AV Consultant in writing that installation is ready for performance and functional testing. The scheduled proof-of-performance review and testing shall be conducted by the Acoustical/AV Consultant. Any failure to meet the established defined or normal industry accepted performance criteria may require re-testing and review. If re-testing and review is required as a result of a failure to meet the required performance criteria the cost for such re-testing shall be borne by the Audio & Video Contractor.

B. Failure of any component or system to meet specifications shall require immediate remedial action. In the event that material, equipment, system, or workmanship shall be found

unacceptable by the Architect or Acoustical/AV Consultant, fifteen (15) days prior to the completion date of the associated area, the Contractor shall assume costs associated with the temporary installation of operational components of systems satisfactory to the Owner's Representative, until Acceptance of the latter work.

3.16 INSTRUCTION AND TRAINING

A. Upon completion of the checkout and correction of any problems found during the checkout, notify Owner and Acoustical/AV Consultant.

B. The Contractor's engineer in conjunction with the Audio & Video Contractor shall, at a time convenient to the Owner and Acoustical/AV Consultant, provide at least four (4) hours of instruction on the programming, operation, maintenance and troubleshooting of the system. The Audio & Video Contractor shall follow-up with a two (2) hour instruction session after 60 days from the first instruction session.

C. Training shall be recorded on DVD by the Contractor. Contractor shall provide two (2) copies of the training video to the Owner.

D. During training, the participants shall be given opportunities for "hands-on" experience with operating the equipment. There shall be visual and audible demonstration using the systems themselves. Personnel for instruction and training for the Audio & Video systems shall be designated by the Owner.

3.17 TURN OVER OF PROGRAMMING

A. The contractor shall provide, to the Owner, two (2) copies of all complete programming of Audio & Video control programming and digital signal processor programming on CD disc. The program files shall be descriptively labeled with regards to their function and programming date. One (1) disc shall be taped securely to the inside of the AV equipment rack where the hardware is installed and one (1) copy shall be presented directly to the Owner.

3.18 OWNERS RIGHT TO USE EQUIPMENT

A. Acceptance of systems provided, as part of the work of this section, will be after completion of corrections "Punch List" which results from inspection of the completed installation of all systems.

B. The Architect or Owner reserves the right to use equipment, material and services provided as part of this section for systems check-out and performance testing, prior to acceptance without incurring any obligation to:

1. Accept any equipment or completed systems until all Punch List work is completed and all systems are acceptable, or;

2. Pay additional costs or charges above those included in the contracts of the parties involved.

END OF SECTION

SECTION 11 53 13

LABORATORY EQUIPMENT

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:
   1. Laboratory fume hoods

B. Related Sections:
   1. Section 06 41 13 “Architectural Casework” for worksurface upon which the fume hood will be mounted.
   2. Division 22 - Plumbing.
   3. Division 23 - Mechanical.
   4. Division 26 - Electrical.

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, furnished specialties and accessories, and finishes.

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
   1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   2. Equipment access points and required space for equipment service and operation.
   3. Setting drawings, templates, and instructions for installing anchor bolts and other anchorages.
   4. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each type of laboratory fume hood, from manufacturer.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For laboratory fume hoods to include in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.

B. Design hoods so that, when connected to exhaust system that provides proper exhaust volume under normal laboratory conditions, fume hoods will operate in a safe, efficient manner, within acceptable tolerances for face velocities specified. Dead air pockets and reverse air currents will not be permitted along surface of hood interiors.

1.7 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of fume hoods with other deliveries of laboratory furniture components.

B. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

PART 2 - PRODUCTS

2.1 FUME HOODS

A. Laboratory fume hood for mounting on surface provided under Section 06 41 13 “Architectural Casework,” and attached to exhaust fan and ductwork provided under Division 23 “HVAC.”

B. ~~B~~ Pass-Through Fume Hoods: Basis of Design product: Provide 4 foot wide Protector Pass-Through Laboratory Hood 9942403 fume hood, for mounting on casework provided by others, by Labconco, Inc. (800-452-1261) or comparable product by one of the following:
   1. Air Master Systems, Fisher Hamilton Scientific, Inc.
   2. Flinn Scientific, Inc.
   3. Kewaunee Scientific Corporation.

C. One-Sided Fume Hoods: Basis of Design product: Provide 4 foot wide Protector ClassMate Laboratory Hood 6970400 fume hood, with ADA base stand and flat epoxy work surface, by Labconco, Inc. (800-452-1261) or comparable product by one of the following:
   1. Air Master Systems, Fisher Hamilton Scientific, Inc.
   2. Flinn Scientific, Inc.
   3. Kewaunee Scientific Corporation.

~~C.~~D. Fabrication:
   1. Provide fume hoods of baffle design to provide a 100 fpm exhaust air volume through the hood when sash is in full open position. Do not provide exhaust fan in fume hood.
   2. Design the hood interior and end panels flush with the entrance shape to prevent eddy currents and backflow of air.
   3. Prepipe and prewire all hoods to a single location on the back of the unit.
      a. Provide one duplex receptacle at each operable sash: 115 volt, 20 amp, GFCI, minimum.
      ~~.~~b. Provide one gas outlet at each operable sash.
   4. Vertical Sliding Sash: Provide 0.125 inch clear polycarbonate.
   5. Provide manufacturer's standard cabinet lock. Furnish two keys.
   6. Include factory finished sides, backs, base and filler panels.
   ~~6.~~7. Provide manufacturer’s ceiling enclosure kit for all units.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, clearances, service rough-ins, and other conditions affecting performance of laboratory fume hood work.

B. Examine walls and floors for suitable conditions where each fume hood will be installed.

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 fume hoods plumb, level, rigid and securely anchored to building and adjacent furniture in proper location, in accordance with manufacturer's instructions.

B. Coordinate sequence of work with mechanical and electrical trades.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Field test each unit after completion of installation to verify proper operation of hoods in accordance with specified requirements. Perform field test in accordance with Section 7 of Scientific Apparatus Makers Association Standard LF-10. Submit field test results to the Architect.

3.4 ADJUSTING AND CLEANING

A. Moving Parts: Carefully check and adjust moving parts to ensure smooth, near silent and accurate sash operation.

B. Clean surfaces, including both sides of sash.

C. Repair damaged work to be equal to new, undamaged work, or replace with new units.

END OF SECTION 11 53 13

SECTION 11 57 00

VOCATIONAL CLASSROOM EQUIPMENT

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. Paint booths.
   2. Four-post automobile lifts.
   3. Two-post automobile lifts.
   4. Welding booths.
   5. Relocation of existing kiln.

B. Related Requirements:
   1. Division 23 – HVAC, for building ventilation systems attached to equipment.
   2. Division 26 – Electrical.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
   2. Motors and pumps: Show nameplate data, ratings, characteristics, and mounting arrangements.

B. Shop Drawings:
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Include details of field assembly for removable equipment, connections, installation, mountings, attachments to other work, and operational clearances.

C. Samples: For each exposed product and for each item and color specified.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans and sections, drawn to scale, and coordinated with floor depressions, cast-in components, connections to ventilation, and connections to power.

B. Qualification Data: For Installer.

C. Product Certificates: For each type of equipment.

D. Sample Warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For vocational equipment to include in emergency, operation, and 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. Environmental Limitations: Do not install vocational equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 COORDINATION

A. Coordinate logistics and product specifications for the existing kiln that is to be relocated.

1.9 WARRANTY

A. Manufacturer standard warranty for each equipment type.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Equipment and anchors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain each type of vocational equipment from single source from single manufacturer.

B. Each equipment type included is described with a single manufacturer and model. Substitutions are allowed. Requests for substitution must be processed according to Section 01 60 00 Product Requirements.

2.3 PAINT BOOTHS

A. Products: Open-Face, Fast-Pack Paint Booths, Model IFP-100806.
   1. Size: Nominal 10 foot wide by 8 foot high, by 6 foot depth.
   2. Ventilation: axial, 10,000 cfm, 30 inch diameter fan with 3 hp explosion-proof motor, 20 filters.
      a. Connection to building ductwork for exhaust from the building.
      b. Ductwork: Manufacturer standard, and in compliance with requirements of Division 23 – HVAC.
   3. Lighting: Two fixtures, 4 foot long with 6 fluorescent lamps.
   4. Construction: 18 gauge G-90 galvanized panel construction.
      a. Doors: Filtered.
      b. Finish: Manufacturer standard. Color selected by Architect from full range of manufacturer standard colors.
   5. Controls: Explosion proof with safety shut down, gun hanger, connection to building HVAC controls.

2.4 AUTOMOBILE LIFTS

A. Four-Post Lift: General Service Lift SM14L, by Rotary.
   1. ALI Certified, with cylinder located under the runway, air filter/regulator/lubricator, adjustable latch bars, one-piece runway, power unit located on the front of the runway, and Dual-function Sentinel Lock system.
   2. Size: 20’-9” Long, 11’-1” Wide, and 6’-10” High posts.
   3. Capacity: 14,000 lbs.
   4. Motor: 2 hp, 208-230v.
   5. Lift Time: 55 seconds for full rise.
   6. Finish: Manufacturer standard. Color selected by Architect from full range of manufacturer standard colors.

B. Two-Post Lift: SPO 10, by Rotary.
   1. ALI Certified, with cylinders in each column, and three-position flip-up adapters for vehicle contact.
   2. Size: 11’-5 ½” Wide, and 11’-8 ½” High, with 31 inch min. and 54 inch max. reach.
   3. Capacity: 10,000 lbs.
   4. Motor: 2 hp, 208-230v.
   5. Lift Time: 45 seconds for full rise.
   6. Controls: on one column, with 110v electric power and compressed air outlet.
   7. Finish: Manufacturer standard. Color selected by Architect from full range of manufacturer standard colors.

2.5 WELDING BOOTHS

A. Products: Economy Booth WB-1000, by Avani Environmental.
   1. Painted steel, three-sided floor-mounted booth with exhaust nozzle.
   2. Ventilation: Connection to building ductwork for exhaust from the building.
   3. Finish: Manufacturer standard. Color selected by Architect from full range of manufacturer standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.
   1. Verify critical dimensions.
   2. Examine supporting structure, subfloors, and footings below finished floor.
   3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements are clearly marked. Locate reinforcements and mark locations.
   4. Coordinate installation requirements of the existing kiln.

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

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions for each type of vocational equipment. Complete equipment field assembly where required.

B. Unless otherwise indicated, install equipment after other finishing operations, including painting, are completed.

C. Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated; in proper relation to adjacent construction.

D. Anchoring to In-Place Construction: Use anchors and fasteners where necessary to secure built-in and permanently placed vocational equipment to structural support and to properly transfer load to in-place construction.

E. Connections: Connect electric operators to building electrical system. Connect exhaust and ventilation ductwork in accordance with requirements of Division 23 – HVAC.

F. Install kiln for permanent use. Complete electrical connections and provide anchors to substrate in accordance with manufacturer recommendations.

3.3 ADJUSTING

A. Cooperate with HVAC Contractor to test and balance the system with regard to vocational equipment.

B. Cooperate with the Contractor and Commissioning Agent to complete required system balancing and adjustment.

3.4 CLEANING

A. After completing equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.

B. Replace equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain vocational equipment.

END OF SECTION 11 57 00

SECTON 11 61 53

DRAPERIES AND RIGGING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and General Conditions of the contract, including General and Supplementary Conditions and Division 1- Specification sections apply to work of this section.

B. Drawing Numbers PED 100, PE 101, 102, 103, 301, 302, 501 and 601 included herewith are a part of this specification.

1.2 RELATED SECTIONS:

A. Division 3, 4 & 5 for Structural supports.

B. Section 11 64 53 – Auditorium Performance Lighting System

C. Section 11 52 00 - Audio & Video Systems

1.3 DESCRIPTION OF WORK:

A. This work includes all materials, labor and incidentals necessary for the construction and installation of the stage draperies, tracks, pipe battens and hardware.

B. The platform rigging and drapery system is designed to comply with the definition of Stage in the IBC. The rigging system is a full-fly system provided to support the drapery and performance lighting system.

C. Drapery and Rigging Installing Contractor is responsible for receiving, placing and supervising the installation of the Drapery & Rigging Systems.

D. The Drapery and Rigging Installing Contractor is responsible for coordination with the Performance Light Systems specified in Section 116453 and the AV Systems specified in section 115200.

1.4 QUALITY ASSURANCE:

A. Subcontractor/Manufacturer's Qualifications:

1. Acceptable Drapery and Rigging Installing Contractor/Manufacturer shall be an organization that principally produces and installs equipment and have been in active business for a period of at least five (5) years. A manufacturer who principally produces commercial draperies is not generally qualified for this type of manufacture

2. The Drapery and Rigging Installing Contractor shall have a responsible representative present throughout the time of the installation to ensure proper installation.

1.5 REFERENCE STANDARDS:

A. All work, materials and equipment shall conform to the IBC 2001 and the accepted rigging practices of the USITT.

B. Manufacturer of all stage equipment shall be of such quality as guided by professional stage rigging practices. Lack of such quality, as judged by the Architect and Theatrical Consultant, or Owner will be grounds for rejection.

C. All materials used in this installation will be first class and new. No seconds will be accepted. Deviation from this requirement will be grounds for rejection.

D. Pre-qualified Contractors:

1. Secoa
   Champlin, Minnesota
   (763) 506-8800

2. Norcostco
   Denver, Colorado
   (303) 620-9734

3. Barbizon
   Denver, Colorado
   (303) 394-9875

4. Oasis Stage Werks
   Salt Lake City, Utah
   (801) 363-0364

5. PRG
   Denver, Colorado
   (720) 440-8330

6. LVH Entertainment Systems
   Oxnard, California
   (805) 278-4584

E. Flameproofing:

1. All drapery fabrics shall be inherently flameproof. The contractor shall furnish notarized affidavits certifying that such fabrics have been tested in accordance with NFPA 701, Standard Method of Fire Tests for Flame Resistant Textiles and Fibers and that such fabrics have been used exclusively in the draperies and fabrics furnished.

2. A cloth statement shall be firmly attached to the header of each drape with the certifying that the material is flameproof and complies with NFPA 701.

1.6 SUBMITTALS:

A. Shop Drawings:

1. Submit a list of major items of equipment to be used, including all items of equipment specified herein. Submit complete fabrication and erection shop drawings as required for the proper execution of the work to be done. Shop drawings shall be submitted to the

Architect and A/V and Acoustical Consultant before any work commences and no work shall be done until proper approvals have been obtained.

2. Shop drawings shall indicate dimensions, arrangements, sections, kinds of materials, sizes, gauges, detail, manufacturer's name and number and all other information necessary for complete fabrication and installation.

3. Submit catalog cut sheets for each separately manufactured item.

4. Submit two samples of all colors available of each fabric type for Architect approval and for color selection. Samples shall be properly tagged as to grade, weight, color and manufacturer.

1.7 WARRANTY:

A. Guarantee all components to be free of defects in material and workmanship for a period of two (2) year from date of final acceptance.

1.8 SERVICE:

A. Respond to, and begin replacement of defective materials and begin repair of faulty workmanship within 48 hours of notification, at no cost to the Owner, during the period of the warranty.

B. Return to the job site at eleven (11) and twenty-two (22) months after final acceptance to inspect the system. Make any required adjustments or repairs necessary to correct changes due to normal wear.

PART 2 – PRODUCTS

2.1 GENERAL:

A. All materials, equipment and apparatus shall be new and of the latest design or model offered for sale by the manufacturer.

B. Principal items of equipment and apparatus are identified herein. Alternate manufacturers are identified in instances in which equivalence has been determined.

C. For all items which are identified by part number and manufacturer, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written out herein.

D. For those items that are not identified by part number and manufacturer, the Contractor may select items that conform to the functional and/or technical specifications. For all such items the Contractor shall submit for approval all technical data which is available from the supplier or manufacturer. Acceptability for use in the systems shall be determined by the Architect and A/V and Acoustical Consultant.

2.2 FABRICS:

A. The Grand Drape and Grand Valance shall be made of 22 oz/yd minimum velour. Fabric shall be Rose Brand Encore inherently flame retardant velour. Architect shall select color of Grand Drape and Grand Valance.

B. Borders, Leg Sets, Mid-Stage Traveler, and Up-Stage Traveler shall be made of 20 oz/yd minimum velour. Fabric shall be Rose Brand Crescent inherently flame retardant velour. Color shall be Black.

C. Cyclorama shall be made of Muslin. Fabric shall be Rose Brand Heavy Weight, Extra Wide Muslin, Natural color.

2.3 TRACKS AND RIGGING:

A. Tracks and Rigging shall include, but not be limited to, the following equipment by H&H Specialties

1. Series 51 Underhung Head Blocks, model 71251N25
2. Series 30 Underhung Loft Blocks, model 830N19, with Idlers as required
3. Series 991 Tee Guide Arbors featuring Nylatron GSM, model 991x4 and 991x8, with ball bearing roller guides
4. Series 70 Tension blocks and guide shoes
5. Tee Bar Guide System, Model 662 Knee Braces, Model 663 Horizontal Wall Battens, Model 665 Steel Tee Bars, Model 667 Arbor Stop Angles.
6. Model 578 Tee Guide Locking Rails, 6" set spacing
7. Series 416SB Cord operated track and hardware for dead hung Grand Drape and full fly Mid-stage and Up-stage traveler. Include back pack guides and rubber bumpers. Account for 3'-0" overlap. Draw from stage right. Include detachable floor block kit 432DK for mid-stage and up-stage traveler.

B. Tracks and Rigging shall include, but not be limited to, the following equipment by JR Clancy

1. SureLock Rope Locks with Safety lockout tags. Ensure rope locks work with rail.
2. Cable cradles with Sheave assemblies.
3. Multiline II Synthetic Rope.

2.4 MISCELLANEOUS HARDWARE:

A. Attachments, purchase lines, operating lines, clamps, fittings, etc. shall be as shown on the drawings or as needed for a complete installation.

2.5 DRAPERY UNIT DESCRIPTION:

A. Grand Valance 47' wide by 4' tall. 100% Full

B. Grand Drape 47' wide (two, 26'-6" sections with 3' overlap) by 19' tall. 100% Full.

C. All borders 47' wide by 4' tall. 75% Full.

D. All leg sets 6' wide by 19' tall. 75% Full.

E. Mid-stage and Up-stage traveller 47' wide (two, 26'-6" sections with 3' overlap) by 19' tall. 75% Full.

F. Cyclorama 47' wide by 19' tall.

2.6 COUNTERWEIGHT:

A. Provide 500 lbs of new counterweight. 300 lbs of 6" wide weights and 200 lbs of 4" wide weights.

B. Clean and reuse existing counterweight. Once accurate amount of weight is established, provide quote for any additional weight needed.

PART 3 – EXECUTION

3.1 FABRICATION OF SOFT GOODS:

A. The largest normal widths of the specified material shall be used. No cut widths shall be used in the fabrication of the drapes. If necessary, an extra width of material shall be used to provide or exceed the specified fullness or width.

B. Shortcut types of manufacture or installation, such at loop or overcast stitching to bind the tops of the draperies, will be grounds for rejection.

C. All seams shall be vertical to the drape for velour drapes. All nap on velour shall be down.

D. Drapes shall be turned on all edges before any hems are sewn in. Where fullness is required, the top of the drape shall be pleated its entire length every 12”. After pleating, a 3-1/2” wide jute webbing shall be sewn over the back of the box pleats with a seam at the top and the bottom of the webbing. Where fullness is not required, the top of the drape shall be hemmed and a 3-1/2” jute webbing shall be sewn to the back of the flat goods with a seam at the top and the bottom.

E. A No. 4 grommet shall be inserted through the center of the pleats (or every 12” on the flat panels) through the webbing, centered 1-1/2” from the top of the drape. Regardless of the spacing, one grommet shall be placed at the end of the drape and another grommet provided 4” from the end of the drape.

F. The bottom hem of all drapes shall be no less than 5”. All drapes with a finished height of 8’ or more shall have a continuous piece of No. 8 jack chain sewn into a canvas sleeve then sewn into a pocket made of the same material as the drape itself on the backside of the drape. This pocket shall be 3” deep and located so that the bottom is 3” from the bottom of the drape. The chain shall be tacked to the pocket every 3’ and secured at each end to prevent bunching.

G. Where linings are specified, the linings shall hang free at the bottom and shall be 4" shorter than the drape. The lining shall be of the same fullness as the drape and shall be secured under the webbing at the top and under the hems at the sides. The lining shall be weighted with a NO. 8 jack chain as previously specified.

3.2 INSTALLATION:

A. Before beginning installation, examine the areas to receive equipment for completeness and security and any other condition that would adversely affect the installation. Report such conditions to the Architects. Satisfactory corrections shall be made before the work proceeds.

B. Work shall be in accordance with accepted trade practices and all items shall be installed in accordance with manufacturer's recommendations. Contractor shall coordinate work so as to cooperate with the activities of other contractors.

C. All items of equipment shall be true, plumb and level.

D. The installation shall be complete in all ways, including all nuts and bolts, chains, ties or attachments indicated by the holes provided for them.

E. Contractor shall do all drilling, fitting and work of a similar character required in the fitting and setting of the material in place and do all cutting and fitting required in connection with the adjoining work of other contractors.

F. Contractor shall provide all connecting members needed for properly supporting and securing the work to the structural members or other parts of the building as may be best suited for each case.

G. Attach all bolts with a locking washer between the structure and the nut.

H. Finish all metal parts with a rust preventative paint or a zinc coating.

I. Contractor shall take into consideration the noise produced by the various components of the system and include reasonable and practical measures to minimize audible noise that might interfere with a performance on stage.

J. All track shall be supported in accordance with the manufacturer's recommendations. Methods of support and hardware shall be as detailed on the drawings.

K. Pipes and traveler tracks can be installed when structure is ready to accept beam clamps and other attachment hardware. Draperies shall not be installed until all final painting and clean up has been fully completed in the platform area.

L. Attach all travelers to their carriers using 3/16" steel "S" hooks. Attach borders, legs and cyclorama to their respective battens with the ties specified. Insert the ½" I.D. weighting pipe in the bottom pocket of the cyclorama.

3.3 DEMONSTRATION:

A. Upon completion of final adjustments, the Contractor shall so notify the Architect and Theatrical Consultant, in writing, and shall request a day and time for conducting a demonstration for the Owner's designated representatives.

B. At the agreed upon day and time, the Contractor shall demonstrate the operation, care and maintenance of each major component of the completed drapery and lighting systems (with participation by the lighting manufacturer engineer). If pressed sleeve fittings have been used, the Contractor shall provide a “Go/No Go” checker to determine adequacy of the crimps.

C. If the need for adjustment or modification becomes evident during the demonstration, the Contractor shall make any necessary adjustments and/or corrections to achieve a properly operating system before acceptance by the Theatrical Consultant.

D. The Theatrical Consultant has allocated one (1) site visit for this checkout. Should additional trips be necessary to complete the checkout, the Contractor shall be liable for such time and associated expenses.

3.4 DOCUMENTATION:

A. AS-BUILT DRAWINGS: The Installer shall supply clean prints of the contract drawings legibly marked in colored pencil or ink to show all changes which were made during fabrication and installation work.

END OF SECTION

SECTON 11 64 53

PERFORMANCE LIGHTING SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Supply and installation of all conduit, wiring and standard electrical boxes for electrical power and control of this lighting system and the electrical termination of all lighting equipment (including receptacles, dimmer racks, plugging strips, etc.) shall be as specified in Division 26 of this specification. Termination of control wiring shall be completed by the Performance Lighting Installing Contractor supplying the Performance Lighting System.

B. Drawing numbers PED 100, PE 101, 102, 103, 301, 302, 501 and 601 shall be considered a part of this specification and the drawings and specification shall be used in conjunction.

1.02 RELATED SECTIONS:

A. Division 3, 4 & 5 for Structural supports.

B. Section 11 61 53 - Draperies and Suspension

C. Section 11 52 00 - Audio & Video Systems

D. Division 26 for Electrical Requirements

1.03 DESCRIPTION OF WORK:

A. The work in this section shall include supply and installation of new equipment components and instruments for the performance lighting system, including house lighting control equipment. Coordinate location of main rack feeds with the Electrical (i.e., bottom rear, top right). Coordinate location of output terminations and conduit with the Electrical. Coordinate delivery and storage with the Contractor. Verify completeness of type and model number of all equipment and components. Furnish supplementary equipment needed to meet system requirements without claim for additional payment.

B. Furnish engineering checkout and instruction in the use of the lighting control systems specified herein.

C. Manufacturer shall support the Performance Lighting Installing Contractor by providing system energization, system configuration, system demonstration and user training in accordance with Paragraph 3.3 herein.

D. Installation and integration of this equipment shall be by the Performance Lighting Installing Contractor who shall be responsible for receiving and storing the equipment at the job site and for supervising the equipment electrical termination.

1.04 QUALITY ASSURANCE:

A. The Manufacturer of the dimming, control and associated equipment specified herein shall have been continuously engaged in the manufacture of theatrical lighting, dimming and control equipment for at least ten (10) years.

B. All equipment supplied under this contract shall comply with IBC 2001 and the National Electrical Code. Equipment shall be UL rated as required by Code.

C. Acceptable manufacturers, based on satisfactorily meeting or exceeding the technical specifications of the equipment listed in this scope, are as follows:

1. Altman Stage Lighting
   Yonkers, NY
   (914) 476-7987

2. Electonic Theatre Controls
   Middleton, WI
   (608) 831-4116

3. Strand Lighting
   Cypress, CA
   (714) 230-8200

4. Desisti
   Mountainside, NJ
   (908) 317-0020

5. SSRC
   Duncan, SC
   (864) 848-9770

D. Manufacturer of all stage equipment shall be of such quality as guided by professional stage rigging practices. Lack of such quality, as judged by the Architect and Theatrical Consultant, or Owner will be grounds for rejection.

E. All materials used in this installation will be first class and new. No seconds will be accepted. Deviation from this requirement will be grounds for rejection.

F. Pre-qualified Contractors:

1. Secoa
   Champlin, Minnesota
   (763) 506-8800

2. Norcostco
   Denver, Colorado
   (303) 620-9734

3. Barbizon
   Denver, Colorado
   (303) 394-9875

4. Oasis Stage Werks
   Salt Lake City, Utah
   (801) 363-0364

5. PRG
   Denver, Colorado

(720) 440-8330

6. Westview Productions
   3217 West Hampden Ave
   Englewood, CO 80110
   (303) 578-8673

7. LVH Entertainment Systems
   Oxnard, California
   (805) 278-4584

1.05 SUBMITTALS:

A. Cohesive system submittal shall include but not be limited to the following:

1. Project cover sheet listing Job Name, integrator project team, manufacturer project team, installing electrician, architect, engineer, and theatrical systems consultant,

2. Any clarifications, RFIs, design team selections which must be returned with reviewed submittal, etc…

3. A single detailed BOM with quantities and manufacturers for all hardware and services provided.

4. Submittal Index

5. Project Specific system wide one line diagram showing electrical interconnections for all systems.

6. Elevations of control room and dimmer room wall showing equipment locations to be coordinated with the AV System Installing Contractor, the Electrical and General Contracors.

7. If the equipment varies from the specified equipment, include plan view drawings which indicate locations and installation techniques for alternate equipment.

8. Project Specific panel schedules for electrical load panels.

9. Project Specific mechanical drawings of the components supplied.

10. Data sheets with P/N supplied highlighted.

11. System Energization electrical contractor’s checklist and request form.

B. Receive approval for these submittal drawings before beginning fabrication or installation.

C. On completion of installation, provide project record documents, complete operation manuals, and as-built submittal drawings in accordance with Paragraph 3.5 herein.

1.06 WARRANTY:

A. Guarantee all components to be free of defects in material and workmanship for a period of two (2) years from date of final acceptance. Power modules in dimmer panels (dimmer, relay, and constant circuit modules) shall have a 5 year 100% replacement warranty.

B. Paint and exterior finishes, fuses and lamps are excluded from above guarantees except when damage or failure results from defective materials or workmanship covered by the guarantee.

1.07 SERVICE:

A. Replace defective materials and repair faulty workmanship within 48 hours of discovery at no cost to the Owner.

B. If during a period of two (2) year from date of final acceptance, any component is out of service for more than one week, due to unavailability of parts or service within that period, supply and install an identical new component. If an identical component is not available, substitute equivalent equipment, but only with the approval of the Owner and Architect.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Provide new materials and equipment conforming to the applicable requirements of:

1. Underwriter's Laboratories

2. National Electrical Code

3. American National Standards Institute

B. For all items which are identified by part number and manufacturer, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written out herein.

C. For those items, which are not identified by part number and manufacturer, the Installer may select items that conform to the functional and/or technical specifications. For all such items, the Installer shall submit for approval all technical data that is available from the supplier or manufacturer.

D. The items listed herein by part number shall establish the minimum acceptable standard for technical and performance characteristics. All equipment shall meet or exceed the technical and performance characteristics of this listed equipment.

E. The Architect shall determine acceptability of such items for use in the system following review and written recommendation by Theatrical Consultant. Such items shall be installed only after receipt of written approval of the Architect.

2.2 COMPONENTS LIST:

A. The performance lighting system shall include, but not be limited to, the following:

Theater Dimmer and Control Equipment:

Description	Manufacturer	Part/Model No.	Qty.

1.	Element Control Console	ETC	LMNT-40-250 / 4330A1020	1
2.	Element Console Channel Upgrade		To 500 Channels	1
3.	22" LCD Monitor	Asus	VS228H-P	1
4.	Control Plug In Station	ETC	EXPB DMXIN / 1094A1005	1
5.	Control Plug In Station	ETC	EXPB NET / 1094A1045	4
6.	ERn2 Wall Mount Enclosure	ETC	ERn2-W-120 / 7180A1010	1
7.	ERn 5 port Ethernet Switch	ETC	ERn-NET / 7180A1004	1
8.	Paradigm Arch Control	ETC	P-ACP / 7180A1009	1
9.	Paradigm Power Module	ETC	P-SPM / 7182A1001	1
10.	Unison Ride Thru Option Kit	ETC	URTO / 7180A1008	1
11.	Unison Slider Station Faceplate	ETC	UH61312-51 / 7181A2602-5A	2
12.	Unison Slider Station	ETC	UH61312 / 7181B2020	2
13.	Sensor3 48-Module Rack	ETC	SR3-48 / 7151A1005-4	1
14.	SR3-48 Locking Door	ETC	SR3-48 Door / 7141A2006-4	1
15.	Sensor3 24-Module Rack	ETC	SR3-24 / 7141A1003-4	1
16.	SR3-24 Door	ETC	SR3-24 Door / 7141A2005-4	1
17.	CEM3 Control Module	ETC	CEM3 / 7140A1003	2
18.	Sensor3 Ride Thru Kit	ETC	SR3-RideThru / 7140K1001	2
19.	Dual 20A Dimmer	ETC	D20 / 7050A1003	70
20.	Air Flow Module	ETC	AFM / 7050A1014	2
21.	Wireless DMX	Show DMX	Show Baby 5	11
22.	Control Room Outlets 1 & 3	SSRC	SM-02-2PGFL	2
23.	Control Room Outlet 2	SSRC	SM-04-2PGFL	1
24.	Net3 2-port Gateway Input	ETC	N3T2G-2M	2
25.	Net3 2-port Gateway Output	ETC	NeT2G-2F	2

B. The Lighting Instruments shall include, but not be limited to, the following:

	Description	Manufacturer	Model No.	Qty.
1.	Ellipsoidal 19 degree with 575W, 2000 hour lamp, fixed beam lens, color frame, C-clamp, black safety	ETC	419-B	4

	cable, 20A stage pin connector			
2.	Ellipsoidal 26 degree with 575W 2000 hour lamp, fixed beam lens, color Frame, C-clamp, black safety cable, 20A stage pin connector	ETC	426-B	6
3.	Ellipsoidal 36 degree with 575W 2000 hour lamp, fixed beam lens, color frame, C-clamp, black safety cable, 20A stage pin connector	ETC	436-B	6
4.	Fresnel 7” with 575W 2000 hour lamp 9-52 degree beam, color frame, C-clamp, black safety cable, 20A stage pin connector	ETC	FRES7-B	12
5.	LED Ellipsoidal 25-50 degree with zoom lens, color frame, C-clamp, black safety cable	ETC	S4LEDL 42550LT 400CF 400SC	4 4 4 4
6.	LED Ellipsoidal 15-30 degree with zoom lens, color frame, C-clamp, black safety cable	ETC	S4LEDL 41530LT 400CF 400SC	4 4 4 4
7.	Power Input Cables	ETC	DPA-A	4
8.	Power Thru Jumpers	ETC	DPJ-5	10
9.	Spare Lamps	ETC	HPL575/115x	6
10.	Spare Safety Cable	ETC	SC	6
11.	Pattern Holder	ETC	400PH-A	6

2.2 Alternate Theater Dimmer & Control Equipment and Fixture Manufacturer:

1. Strand Lighting
2. Listing of an alternate manufacturer does not preclude the manufacturer from meeting all technical and performance specifications of the project

PART 3 – EXECUTION

3.1 SYSTEM DESCRIPTION AND FUNCTION:

A. Provide all materials, devices, components, and equipment required for complete, operational systems.

B. Auditorium: Remove and replace existing equipment with equipment specified herein. Reuse existing wire and conduit as possible. Provide new conduit and pull new wire to new dimmed circuits located beneath control booth window opening. Pull new low voltage data wire for new architectural control stations and new console connection locations as necessary.

C. The performance lighting and house light control system will utilize a 140 dimmer system controllable with a micro-processor based controller designed for the live performance market. Light control stations mounted at the platform manager's and booth control console positions will provide presets for operation of selected circuits for house light control, simple meetings, program presentation lectures and similar activities where a lighting control operator may not be available. Entry stations located at each entry door will provide simple "On/Off" control of the auditorium house lights. A complement of appropriate lighting instruments will be provided. Eight circuits located beneath the control booth window are new. The remainder of the performance lighting distribution is existing and is to be refurbished and/or repaired and reused.

House lighting will run on a separate dimming system, provided by electrical.

3.2 EQUIPMENT REFURBISH AND REPAIR

A. Inspect floor pocket outlets and clean and/or repair as needed to return them to a useable condition. Bring attention to any equipment that requires replacement.

B. Inspect all stage electrics, tormentor electrics, and house electrics. Clean and/or repair as needed to return them to a useable condition. Bring attention to any equipment that requires replacement.

3.3 FABRICATION:

A. Field verify all dimensions prior to fabrication.

B. Supply completely assembled and tested racks with all wiring completed as required to provide a complete system, to the extent such items are not provided by others.

C. Clearly, logically and permanently mark switches, connectors, jacks, relays, receptacles, cables and cable termination through either paint-filled engraving in the metal or silk screening.

D. Fabricate the equipment so as to provide safe operation.

E. Provide ventilation as required to maintain the equipment within safe temperature limits.

3.4 DELIVERY AND ENGINEERING CHECKOUT:

A. The equipment shall be crated at the factory in such a manner as to prevent damage during anticipated handling by freight companies. The Performance Lighting Installing Contractor shall be responsible for safe and adequate storage between delivery and installation.

B. Upon notification by the Performance Lighting Installing Contractor of installation completion, but prior to energization of the system, the Manufacturer shall provide complete engineering checkout of the installation to ensure compliance with Manufacturer's installation instructions.

3.5 DEMONSTATION AND TRAINING:

A. Upon completion of the checkout and correction of any problems found during the checkout, notify Owner, Architect, and A/V and Acoustical Consultant.

B. The Manufacturer's engineer in conjunction with the Performance Lighting Installing Contractor shall, at a time convenient to the Owner, Architect and A/V and Acoustical Consultant, provide at least four (4) hours of instruction on the programming, operation, maintenance and troubleshooting of the system.

3.6 DOCUMENTATION:

A. The Manufacturer shall provide, to the Performance Lighting Installing Contractor, five (5) copies of the complete operation and maintenance manuals for the system. Manufacturer shall also provide five (5) copies of all catalogue cut sheets of major items in the system, as-built drawings, along with wiring diagrams and parts lists of the system.

B. Submit the following Record Drawings developed from the final "as built" systems. Comply with Division 1, General Contract Conditions and the following:

C. Three (3) copies and one (1) reproducible of each of the block diagrams, plans, risers, rack elevations, cable schedules and detail drawings. Reproducible shall be in the form of AutoCad drawing files.

D. No more than thirty (30) days after Acceptance Testing, submit three (3) bound copies of each of the following manuals prior to, and as a requirement of, Owner acceptance of the work of this section:

E. Equipment operating instructions; complete, comprehensive instructions for the operations of all contractor fabricated devices and equipment items provided as part of the work of this section.

F. Systems operating instructions; step-by-step, complete, comprehensive instructions for the operation of the systems provided as part of the work of this section. Including the normal settings of all front panel controls or switches.

G. Manufacturer's original operation, instruction and service manuals; all brochures, manuals and service sheets published by the manufacturers of the components, devices and equipment supplied. Original printed copies only, photocopies not acceptable.

END OF SECTION

SECTION 11 66 23

GYMNASIUM EQUIPMENT

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. Basketball equipment.
2. Volleyball equipment.
3. Scoring systems.
4. Shot clocks.
5. Gymnasium Divider Curtain.
6. Wrestling Mat Storage Hoist System.
7. Throwing Cage.
8. Ceiling-Suspended Throwing Curtain.
9. Wall-Mounted Safety pads.
10. Pole Vault box.
11. Long Jump pit system.
~~9.~~12. Relocate existing climbing wall from existing school.

B. Related Requirements:
1. Section 03 30 00 "Cast-in-Place Concrete" for installation of floor insert sleeves.
2. Section 09 64 66 "Wood Athletic Flooring" for game lines and markers.
3. Section 09 65 66 "Resilient Athletic Flooring" for game lines and markers.

1.3 DEFINITIONS

A. FIBA: Federation Internationale de Basketball Amateur (The International Basketball Federation).

B. FIVB: Federation Internationale de Volleyball (The International Volleyball Federation).

C. NFHS: National Federation of State High School Associations.

D. USAV: USA Volleyball.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.

B. Shop Drawings: For gymnasium equipment.
1. Include plans, elevations, sections, details, and attachments to other work.
2. Include details of field assembly for removable equipment, connections, installation, mountings, floor inserts, attachments to other work, and operational clearances.
3. Include transport and storage accessories for removable equipment.

C. Samples: For each exposed product and for each item and color specified.

D. Samples for Initial Selection: For each type of gymnasium equipment.

E. Samples for Verification: For the following products:
1. Basketball Net: Full size.
2. Volleyball Net: Minimum 12-inch (305-mm) length by full height, including one edge and net accessories.
3. Volleyball Floor Insert: Full-size unit.
4. Volleyball Post Standard: Full-size unit with net tensioner.

5. Pad Fabric: Wall padding not less than 3 inches (76 mm) square and corner and column samples not less than 3 inches (76 mm) long, with specified treatments applied. Mark face of material.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Court layout plans, drawn to scale, and coordinated with floor inserts, game lines, and markers applied to finished flooring.

B. Qualification Data: For Installer.

C. Product Certificates: For each type of gymnasium equipment.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

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

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces 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: Verify position and elevation of floor inserts and layout for gymnasium equipment.

1.9 COORDINATION

A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.

B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension-system components with other construction including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

~~B.~~C. Coordinate Owner requirements for the climbing wall and schedule dates for relocation of equipment.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period. Warranty Period varies according to system. All warranties begin at Substantial Completion.

1. Basketball System:
   a. Folding Backstop Support System: 25 years.
      1) Electric Winch: 1 year.
   b. Glass Backboard: Lifetime.
   c. Shock-Absorbing Goal: 5 year.
   d. Backboard Padding: 3 year.
2. Gymnasium Divider Curtain: 1 year.
3. Wrestling Mat Storage Hoist System: 1 year.
4. Throwing Cage: 1 year.
5. Ceiling-Suspended Throwing Curtain: 1 year.
6. Wall Safety Pads: 1 year.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Basketball backstops and anchors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain gymnasium equipment from single source from single manufacturer, except: ~~s~~

1. Scoreboards shall be manufactured by Daktronics.

~~1.~~2. Pole Vault and Long Jump equipment shall be manufactured by UCS and SportsEdge.

B. Basis-of-Design Products: Model Numbers indicated below are as manufactured by Porter Athletic, Inc. Subject to compliance with requirements, provide product indicated or a comparable product by one of the following:

~~1. AALCO Manufacturing.~~

1. Draper, Inc.

2. ADP Lemco.

a. Note that paragraph 2.2.A (above) requires all specified gymnasium equipment be provided by one manufacturer.

~~2. Performance Sports Systems; a Gared Holdings company.~~

2.3 CONTROLS

A. Electrified equipment shall be controlled by electronic keypad control system. Provide one complete control system for the Main Gymnasium and one complete control system for the Auxiliary Gymnasium.

1. One complete system shall include at least:

a. One Keypad: Porter Athletic #02555-000 POWR-TOUCH 2.5 Simultaneous Operation Gymnasium Control Center. One Equipment Legend: Porter Athletic #92500-000 Equipment Legend. Control Panels: Porter Athletic #12555-200 (quantity as required to operate all electrified equipment).**BASKETBALL EQUIPMENT**

A. General: Provide equipment complying with requirements in NFHS's "NFHS Basketball Rules Book."

B. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.

C. Provide manufacturer's recommended connections complying with Section 05 50 00 "Metal Fabrications" of size and type required to transfer loads to building structure.

D. Ceiling Suspended, Center Strut, Forward Folding, Forward Braced Backstop System: Porter Athletic #950 Series.

1. Provide manufacturer's standard assembly, with hardware and fittings to permit folding.
2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
   a. Finish: Manufacturer's standard polyester powder-coat finish. Color: Flat White.

E. Backstop Safety Device: Designed to limit free fall if support cable, chains, pulleys, fittings, winch, or related components fail; with mechanical automatic reset; 6000-lb (2722-kg) minimum load capacity; one per folding backstop: Porter Athletic #10797-100.

1. Retractor Device: Manufacturer's standard.

F. Backstop Electric Operator: Provide operating machine of size and capacity recommended by manufacturer for equipment specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, and remote controls. Coordinate wiring requirements and electrical characteristics with building electrical system: Porter Athletic #706 Series.

1. 1,200 pound capacity.
2. 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.
3. Operator Type: Cable drum with grooved drum and cable tension device to automatically take up cable slack and retain cable in grooves.
4. Motor Electrical Characteristics:
   a. Voltage: 120 V.
   b. Horsepower: 1/2 hp.
5. Remote-Control Station: Centralized with controls for all gymnasium equipment.

6. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop basketball equipment at fully retracted and fully lowered positions.

G. Basketball Backboards:
1. Center Strut Rectangular Glass Backboard with Aluminum-Faced Steel Frame (3'-6" x 6'-0"): Porter Athletic #208 Series.
2. Backboard Material: With predrilled holes or preset inserts for mounting goals, and as follows:
a. Glass: Not less than 1/2-inch- (13-mm-) thick, transparent tempered glass complying with ASTM C 1048 Kind FT (fully tempered) and with impact testing requirements in 16 CFR 1201 Category II or ANSI Z97.1 Class A for safety glazing. Provide glass and framing system manufactured to comply with FIBA Level 1 or Level 2 requirement that glass does not split off if broken. Provide glass with impact-absorbing resilient rubber or PVC gasket around perimeter.
3. Frame Finish: Aluminum and powder coated steel. Color: Grey.

H. Basketball Goals: Shock Absorbing Goal with Nylon Anti-Whip Net. Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring: Porter Athletic #223 Series Powr-Flex Goal with tube ties.
1. Color: Orange.

I. Backboard Safety Pads: Bolt-On 2-Piece Polyurethane Backboard Padding with Integral Skin, Molded Square Corners, and Molded-In Clearance for Goal Mounting Plate and Center-Strut. Designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports per manufacturer's standard design: Porter Athletic #326 Series.
1. Color: Green.

J. Shot Clock Support: Porter Athletic #SCS00512.
1. Finish and color to match backstop support system.
2. Application: One pair for Main Court in Gymnasium.

K. Custom Printed Graphic Backstop Banner: Porter Athletic #909 Series.
1. Application: One pair for Main Court in Main Gymnasium.

L. Wall-Mounted, Side Fold, Backstop: Porter Athletic #90220000.
1. Provide manufacturer's standard assembly, with hardware and fittings to permit folding.
2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
a. Finish: Manufacturer's standard polyester powder-coat finish. Color: Flat White.
3. Provide electric operation.
4. Provide basketball backboards, basketball goals, and backboard safety pads to match the equipment provided with the ceiling suspended Porter Athletic #950 Series described above.

2.5 VOLLEYBALL EQUIPMENT

A. General: Provide equipment complying with requirements in NFHS's "NFHS Volleyball Rules Book."

B. Provide 3 complete systems (for 3 courts) in Main Gym and 3 complete systems (for 3 courts) in Auxiliary Gym.
1. Floor Insert: Solid-brass floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized to accept 3 ½" diameter standard, not less than 9 inches (228 mm) long to securely anchor pipe sleeve in structural floor, with anchors designed for securing floor insert to floor substrate. Porter Athletic #00872-200.
a. Floor Insert Adapters for Second Floor Installations: Sized to accept 3 ½" diameter standard. Porter Athletic #00879-000.
2. Post Standards: Removable, paired volleyball post standards. Adjustable, telescoping height. Designed for easy removal from permanently placed floor insert supports. Fabricated from pipe or tubing, with nonmarking plastic or rubber end cap or floor bumper to protect permanent flooring. Finished with manufacturer's standard factory-applied, polyester powder-coat finish complying with finish manufacturer's written instructions for

surface preparation, including pretreatment, application, baking, and minimum dry film thickness or plated metal finish. Porter Athletic #01991-000.

3. Safety Pads for Standards: Comply with NFHS requirements. Provide pads consisting of not less than 1-1/2-inch thick, multiple-impact-resistant crosslinked or closed-cell polyethylene foam filler covered by puncture- and tear-resistant vinyl-coated polyester reinforced fabric cover; with fire-test-response characteristics indicated. Provide pads with hook-and-loop closure. Porter Athletic #00839-0xx
   a. Color: Green.
4. Net: 32 feet (9.75 m) long; one per pair of paired post standards; and as follows. Porter Athletic #02295-(width required).
   a. Width and Mesh: Competition volleyball net, 39 inches (990 mm) with 4-inch- (102-mm-) square mesh made of black nylon string.
   b. Hem Band Edges: White, not less than 2-inch- (50-mm-) wide top, bottom, and side bindings; not less than 1-inch- (25-mm-) wide tension straps at top, bottom, and midpoint of each side end of net; end sleeves for dowels; and lines with linkage fittings threaded through top and bottom hems of binding. Provide lengths of lines and linkage fittings as required to properly connect to and set up net for post standard spacing indicated on Drawings.
   c. Top Line: Not less than 1/4-inch- (6-mm-) diameter rope.
   d. Dowels: Not less than 1/2-inch- (13-mm-) diameter fiberglass or 1-inch- (25-mm-) diameter wood. Provide two dowels per net threaded through each side hem sleeve for straightening net side edges.
5. Net Antennas: 3/8-inch- (9.5-mm-) diameter, high-tensile-strength, extruded-fiberglass or plastic rods, 72 inches (1800 mm) long, extending above top hem band of net, with alternating white and red bands according to competition rules. Provide two antennas per net. Porter Athletic #02296-100.
   a. Clamps: Designed to secure antenna to top and bottom of net.
6. Boundary Tape Markers: 2-inch- (50-mm-) wide white strip, secured to net top and bottom with hook-and-loop attachment. Provide two tape markers per net for marking court boundaries. Porter Athletic #02297-000

C. Judges' Stands: Provide one for Main Court in Main Gym and One for Main Court in Auxiliary Gym. Porter #0099-000.
   1. Manufacturer's standard unit designed to be attached to and supported by post standard. Fabricate welded-steel tubing units with finish and color to match post standards.
   2. Pads for Fitted Judge’s Stands. Color: Green. Porter Athletic #00993-1xx.
   3.

D. Transporter for Volleyball Standards and Judges Stand: One for Main Gym and One for Auxiliary Gym.
   1. Manufacturer's standard wheeled unit designed for storage for three courts and one judge’s stand, and transporting volleyball equipment and passing through 36-inch- (910-mm-) wide door openings. Fabricate welded-steel tubing units with heavy-duty casters, including no fewer than four swivel casters. Fabricate wheels from materials that do not damage or mark floors; number of units as required to provide transport and storage for specified equipment. Porter Athletic #00956-100.

E. Volleyball Net Storage Rack: One for Main Gym and One for Auxiliary Gym.
   1. Configuration: Storage for three nets. Porter Athletic #00823-100.

2.6 SCORING SYSTEMS

A. For the Main Gymnasium. Provide complete scoring system with 2 scoreboards with wireless control from one scorer’s table location.
   1. Single-sided LED basketball scoreboard: Daktronics #BB-2123 Scoreboard.
      a. Team Name Message Centers.
      b. Double Bonus Indicators.
      c. All Sport 5000 Control Console with All Sport Radio Control Option.
      d. Color: As selected by Architect from not less than 150 standard colors.
      e. Wall-mounted.

B. For the Auxiliary Gymnasium. Provide complete scoring system with 2 scoreboards with wireless control from one scorer's table location.
   1. Single-sided LED basketball scoreboard: Daktronics #BB-2125 Scoreboard.
      a. All Sport 5000 Control Console with All Sport Radio Control Option.
      b. Color: As selected by Architect from not less than 150 standard colors.
      c. Wall-mounted.

2.7 SHOT CLOCKS

A. Main Gymnasium. Provide 1 pair for main court.
   1. Two-Sided transparent LED basketball game clock and shot clock: Daktronics #BB-2140.
   2. Shot clocks shall be able to be controlled wirelessly through scoring system specified above.
   3. Mounted to backstop support system.

2.8 GYMNASIUM DIVIDER CURTAIN SYSTEM

A. Provide 4 complete systems in Main Gym and 1 complete system in Auxiliary Gym.
   1. Solid Fabric (lower 8'-0") and Mesh (above 8'-0"). Color: Green.
      a. Roll-Up Gymnasium Divider Curtain. Porter Athletic #675 Series.
   2. Electric Winch for Gymnasium Divider Curtain. Horsepower: ¾ HP. Control: Electronic Keypad.
   3. Line Shaft Safety Lock.
      a. Porter Athletic #10796-000.

2.9 WRESTING MAT STORAGE HOIST SYSTEM

A. Provide 1 complete system in Auxiliary Gym. Porter Athletic #91102200.
   1. Ceiling Suspended Stationary Mat Mover.
      a. Configuration: Dual Sling (One Large Sling).
      b. Control: Electronic Keypad.
      c. Sling Color: Green.
   2. Mat Mover Safety Locks: Porter Athletic #PL2000.
      a. Quantity per Mat Mover as Required by Manufacturer).

2.10 THROWING CAGE

A. Provide 1 complete system in Auxiliary Gym.
   1. Ceiling Suspended Indoor Throwing Cage: Porter Athletic #GP732280.
   2. Electric Winch for Ceiling Suspended Indoor Throwing Cage: Porter Athletic #00707-000.
      a. Horsepower: ¾ HP.
      b. Control: Electronic Keypad.

2.11 CEILING-SUSPENDED THROWING CURTAIN

A. Provide 1 complete system in Auxiliary Gym.
   1. Ceiling Suspended Throwing Curtain: Porter Athletic #93002W.
      a. Size: 30'-0" Wide x 20'-0" High.

2.12 SAFETY PADS

A. Location: Behind basketball backstop and as indicated on the drawings.

B. Configuration: No Nailing Margin. Mounted a maximum of 4 inches above finished floor.

C. Safety Pad Surface-Burning Characteristics: ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 450 or less.

D. Certification: GREENGUARD Certified for Children and Schools.

E. Pad Coverings: Provide safety pad fabric covering that is fabricated from puncture- and tear-resistant, PVC-coated polyester or nylon-reinforced PVC fabric, not less than 15-oz./sq. yd and treated with fungicide for mildew resistance.

F. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered

by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board. Porter Athletic ~~#00576-1xx~~ 00561-0xx 3".

1. Backer Board: Not less than 7/16 inch thick plywood or composite panel.
2. ~~Fire-Resistive~~ Fill: Multiple-impact-resistant foam not less than 3 inch thick.
3. Size: Each panel section, 24 inches wide by dimension indicated. Where height of pad is not dimensioned on the Drawings, provide ~~not less than 70~~ 72 inches ~~long~~.
4. Number of Modular Panel Sections: As indicated.
5. Installation Method: ~~Concealed mounting Z-clips top and bottom~~Mechanical fastening through wood nailing margin.
6. Fabric Covering Color: Green.
7. Cut-out Trim: Provide manufacturer's standard flanged cut-out trim kits for fitting pads around switches, receptacles, and other obstructions.

G. Round Column Safety Pads: Wraparound pads fully covering exposed round column to height indicated. Porter Athletic #97061000.

1. Fire-Resistive Fill: Multiple-impact-resistant foam not less than 2 inch thick, with cord lace and grommet attachment to column.
2. Length: Dimension indicated. Where height of pad is not dimensioned on the Drawings, provide 72 inches.
3. Fabric Covering Color: Green.
4. Cut-out Trim: Provide manufacturer's standard flanged cut-out trim kits for fitting pads around switches, receptacles, and other obstructions.

H. Safety Pads over Mirrors in Wrestling Room: Padded wall panels designed to be removable; each panel section consisting of pad laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.

1. Backer Board: Not less than 3/4 inch thick plywood.
2. Fill: Multiple-impact-resistant foam not less than 3 inch thick.
3. Size: Each panel section, 24 inches wide by dimension indicated.
4. Number of Modular Panel Sections: As indicated.
5. Installation Method: Concealed mounting Z-clips top and bottom.
6. Fabric Covering Color: Green.

2.13 POLE VAULT BOX

A. Basis of Design: Subject to compliance with requirements, provide UCS cast aluminum vault box 711-1000, with UCS flush pole vault box cover 711-1401, or comparable product.

B. Vault Box:

1. Cast aluminum, ½ inch thick, with brackets for setting in concrete.
2. Electrostatically powder coated.
   a. Color as selected by Architect from manufacturer's full range of standard colors.
3. All edges eased.

C. Vault Box Cover:

1. Galvanized steel: 12 gauge, with two underside reinforcing ribs, welded and reinforced construction.
2. Finish: Mill.

2.14 LONG JUMP PIT SYSTEM

A. Basis of Design: Products listed below are by Aluminum Athletic Equipment (AAE) and Sportsfield Specialties. Comparable products by other manufacturers will be considered. See Section 01 60 00 Product Requirements for submittal requirements for proposed comparable products.

B. Pit Form: AAE Model PFS-HS-SC High School Long Jump/Triple Jump Pit Form System with Sand Catcher.

1. Size: Overall pit dimensions nominally 23 feet by 10 feet.
   a. Pit for height: 24 inches.
2. Materials: 12 gauge galvanized steel pit form with stainless steel sand catchers.
3. Covers:

a. Solid cap attached to metal frame at runway end of pit. Recess cap for final finish with resilient athletic flooring (Section 09 65 66) flush with adjacent floor.
b. Sand catcher covers: Removable aluminum grates, recessed for final finish with resilient athletic flooring (Section 09 65 66) flush with adjacent floor.
c. Pit covers: Removable aluminum planks, recessed for final finish with resilient athletic flooring (Section 09 65 66) flush with adjacent floor.

4. Accessories: Vinyl sand catcher tarp, AAE Model No, PFS-HS-VSCT.

C. Take Off Board: Model TFLT0012SS 12 inch Take Off Board by Sportsfield Specialties.

~~7.~~1. Stainless steel recessed form with 8 inch take-off board, 4 inch foul board, lift handles and installation accessories.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.
1. Verify critical dimensions.
2. Examine supporting structure, subfloors, and footings below finished floor.
3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements are clearly marked. Locate reinforcements and mark locations.

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

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly where required.

B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, are completed.

C. Permanently Placed Gymnasium Equipment and Components: Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated; in proper relation to adjacent construction; and aligned with court layout.
1. Floor Insert Location: Coordinate location with application of game lines and markers.
2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and floor-plate type.
3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.

D. Wall Safety Pads: Mount with bottom edge at 4 inches (102 mm) above finished floor, unless indicated otherwise.

E. Cut-out Trim: Limit cuts in face of padding from trim unit's corner-to-corner outside dimensions. Install with ends of cuts concealed behind trim flange.

F. Anchoring to In-Place Construction: Use anchors and fasteners where necessary to secure built-in and permanently placed gymnasium equipment to structural support and to properly transfer load to in-place construction.

G. Connections: Connect electric operators to building electrical system.

H. Removable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble removable gymnasium equipment after assembled configuration is approved by Architect, and store units in location indicated on Drawings.

~~H.~~I. Climbing Wall: Remove existing climbing wall and mounting equipment and relocate to new building, where indicated. Provide new fasteners appropriate for materials and substrates.

Clean equipment and repair minor damage such that the relocated climbing wall will be complete and in as-new condition.

3.3 ADJUSTING

A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.

B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment.

END OF SECTION 11 66 23

SECTION 12 21 13

HORIZONTAL LOUVER BLINDS

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. Horizontal louver blinds.

B. Related Requirements:
   1. Section 06 10 00 "Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.

C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.

D. Samples for Initial Selection: For each type and color of horizontal louver blind.
   1. Include similar Samples of accessories involving color selection.

E. Samples for Verification: For each type and color of horizontal louver blind indicated.

F. Window-Treatment Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of horizontal louver blind.

B. Product Test Reports: For each type of horizontal louver blind, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and 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.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet 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 horizontal louver blinds 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.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Décor Aluminum Blinds by Hunter Douglas, or comparable product by one of the following:
   1. Levolor Contract; a Newell Rubbermaid company.
   2. Springs Window Fashions.

C. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners and “bounce back.”
   1. Width: 1 inch (25 mm).
   2. Thickness: Manufacturer's standard.
   3. Spacing: Manufacturer's standard.
   4. Finish: Ionized antistatic, dust-repellent, baked polyester finish.

D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
   1. Capacity: One blind per headrail unless otherwise indicated.
   2. Ends: Capped or plugged.
   3. Manual Lift Mechanism:
      a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
   4. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
      a. Tilt: Full.
      b. Tilt: Two-direction.
      c. Operator: Clear-plastic wand.
      d. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
   5. Manual Lift-Operator and Tilt-Operator Lengths: Full length of blind when blind is fully closed.
   6. Manual Lift-Operator and Tilt-Operator Locations: Manufacturer's standard.
   7. Integrated Headrail/Valance: Curved face.

E. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
   1. Type: Manufacturer's standard.

F. Lift Cords: Manufacturer's standard braided cord.

G. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.

H. Valance: Manufacturer's standard.

I. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
   1. Type: Overhead.
   2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

A. Colors, Textures, Patterns, and Gloss:
   1. Slats: As selected by Architect from manufacturer's full range.
   2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.2 HORIZONTAL LOUVER BLIND FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped 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 (23 deg C):
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
   1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.

D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

F. Color-Coated Finish: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.

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

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
   1. Locate so exterior slat edges are not closer than 1 inch (25 mm) from interior faces of glass and not closer than 1/2 inch (13 mm) from interior faces of glazing frames through full operating ranges of blinds.
   2. Install mounting and intermediate brackets to prevent deflection of headrails.
   3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer and that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

END OF SECTION 12 21 13

SECTION 12 22 00

CURTAINS AND DRAPES

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 draperies and drapery rods.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For the following:
   1. Rods: Include maximum weights of draperies that can be supported.
   2. Fabrics and textile treatments.

C. Shop Drawings:
   1. Rods: Show installation and anchorage details and locations of controls.
   2. Draperies: Show sizes, locations, and details of installation.

A. Coordination Drawings: Reflected ceiling plans drawn to scale, and ceiling-mounted items:
   1. Valance and suspended ceiling components

D. Samples: For each drapery fabric and for each color and texture specified, 10 by 8 inches (250 by 200 mm) in size.

E. Samples for Initial Selection: For each type of product indicated.

F. Samples for Verification: As follows:
   1. Drapery Rods: 18 inches (450 mm) long, with carriers, controls, and accessories.
   2. Drapery Fabrics: For each color and pattern indicated, full width by 36 inches (1000 mm) long, from dye lot to be used for the Work and with specified textile treatments applied. Show complete pattern repeat if any. Mark top and face of fabric.
   3. Textile Trims: For each color and pattern indicated, 18 inches (450 mm) long.
   4. Drapery Fabrication Samples: For each heading, fabric, color, and pattern indicated, a complete full-size panel to verify details of fabrication and thread colors.

1.4 INFORMATIONAL SUBMITTALS

B. Coordination Drawings: Reflected ceiling plans drawn to scale, and ceiling-mounted items:
   1. Valance and suspended ceiling components

A. Product Certificates: For each fabric treated with flame retardant, signed by fabric supplier and indicating treatment durability and cleaning procedures required to maintain treatment effectiveness.

1.5 CLOSEOUT SUBMITTAL

A. Maintenance Data: For products to include in maintenance manuals.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before drapery fabrication, and indicate measurements on Shop Drawings.

B. Scheduling: Do not deliver or install draperies until after other finish work, including painting, is complete and spaces are otherwise ready for occupancy.

PART 2 - PRODUCTS

2.1 DRAPERY AND DRAPERY RODS

C. Basis of Design: Hunter Douglas Hospitality, with valance: pinch pleat, blackout fabric on ceiling-mounted ADA baton hardware. Blackout fabric: 3-pass blackout, white flannel underlining, and printed fabric. Or, comparable product by one of the following:

1. Acceptable Substitution: See Section 01 60 00 Product Requirements.

2.2 DRAPERY FABRICATION

A. Fire-Test-Response Characteristics: Provide products that pass NFPA 701 as determined by testing of fabrics that were treated using treatment-application method intended for use for this Project by a testing and inspecting agency acceptable to authorities having jurisdiction.

D. Fabricate draperies in heading styles and fullnesses indicated. Fabricate headings to stand erect. If less than a full width of fabric is required to produce panel of specified fullness, use equal widths of not less than one-half width of fabric located at ends of panel.

E. Center-Opening Draperies: Add 10 inches (254 mm) to overall width for overlap.

F. Seams: Sew vertical seams with twin-needle sewing machine with selvage trimmed and over-locked. Join widths so that patterns match and vertical seams lay flat and straight without puckering. Horizontal seams are not acceptable.

G. Side Hems: Double-turned, 1-1/2-inch- (38-mm-) wide hems consisting of three layers of fabric, and blindstitched so that stitches are not visible on face of drapery.

H. Bottom Hems: Double-turned, 4-inch- (102-mm-) wide hems consisting of three layers of fabric, and weighted and blindstitched so that weights and stitches are not visible on face of drapery.
1. Sew in square lead weights at each seam and at panel corners.

I. Interlinings: Extend from top of drapery to within 1/2 inch (13 mm) of lining's bottom hem and to leading edge of side hems to produce full-shadowed appearance.

J. Linings: Equal to widths of drapery fabric and joined to drapery fabric at top by inside invisible seam, and hand stitched at side hems and shadowed with 1-1/2-inch (38-mm) return of face fabric.

PART 3 - EXECUTION

3.1 DRAPERY ROD INSTALLATION

A. Install track systems according to manufacturer's written instructions, level and plumb, and at height and location in relation to adjoining openings as indicated on Drawings.

B. Isolate metal parts of tracks and brackets from concrete, masonry, and mortar to prevent galvanic action. Use tape or another method recommended in writing by track manufacturer.

3.2 DRAPERY INSTALLATION

A. Where draperies abut overhead construction, hang draperies so that clearance between headings and overhead construction is 1/4 inch (6.4 mm).

B. Where draperies extend to floor, install so that bottom hems clear finished floor by not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm).

C. Where draperies extend to windowsill, install so that bottom hems hang above sill line and clear sill line by not more than 1/2 inch (13 mm).

3.3 ADJUSTING

A. After hanging draperies, test and adjust each track to produce unencumbered, smooth operation.

B. Steam and dress down draperies as required to produce crease- and wrinkle-free installation.

C. Remove and replace draperies that are stained or soiled.

END OF SECTION 12 22 00

SECTION 12 24 13

ROLLER WINDOW SHADES

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. Manually operated roller shades with single rollers.

B. Related Requirements:
   1. Section 06 10 00 "Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
   2. Section 07 92 00 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product.
   1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

C. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

D. Samples for Initial Selection: For each type and color of shadeband material.
   1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of roller shade.
   1. Shadeband Material: Not less than 10 inches (250 mm) square. Mark inside face of material if applicable.
   2. Installation Accessories: Full-size unit, not less than 10 inches (250 mm) long.

F. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades 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. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.~~

~~1.7~~1.6 QUALITY ASSURANCE

A. Installer Qualifications: Trained and certified by roller window shades manufacturer.

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. 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.

~~1.8~~1.7 **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.

~~1.9~~1.8 **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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Classic Mecho/5 roller shade system with EcoVeil Screens 1550 Series 3% Open ~~Equinox Blackout~~ shadecloth by MechoShade Systems, or comparable product by one of the following:
1. Draper Inc.
2. Hunter Douglas Contract.
3. Acceptable Substitution: See Section 01 60 00 Product Requirements.

B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. 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.
2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.
   a. Provide for shadebands that weigh more than 10 lb (4.5 kg) or for shades as recommended by manufacturer, whichever criteria are more stringent.

B. 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 inside face of shade, unless indicated otherwise.
2. Direction of Shadeband Roll: Regular, from back of roller.
3. Shadeband-to-Roller Attachment: Removable spline fitting integral channel in tube.

C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

D. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

E. Shadebands:
1. Shadeband Material: Light-blocking fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
   a. Type: Enclosed in sealed pocket of shadeband material.
   b. Color and Finish: As selected by Architect from manufacturer's full range.

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 when shade is fully open.
2. Endcap Covers: To cover exposed endcaps.
3. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 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-Blocking Fabric: Opaque fabric, stain and fade resistant.
1. Source: Roller-shade manufacturer.
2. Type: Fiberglass with acrylic backing.
3. Roll Width: 98 inches.
4. Features:
   a. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.
5. Color: As selected by Architect from manufacturer's full range.

2.4 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 (23 deg C):
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch (6 mm) per side or 1/2-inch (13-mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

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 panels 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, 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.
1. Opaque Shadebands: Located so shadeband is not closer than 2 inches (51 mm) to interior face of glass.

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 DEMONSTRATION

A. 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

SECTION 12 35 51

MUSIC EDUCATION STORAGE CASEWORK

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 Music Room instrument storage cabinets.

B. Related Requirements:
   1. Section 06 10 00 "Rough Carpentry."
   2. Section 06 41 13 "Architectural Casework."

1.3 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For the following:
   1. Casework.
   2. Cabinet hardware.

C. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.

D. Samples for Initial Selection: For cabinet and hardware finishes.

E. Samples for Verification: 8-by-10-inch (200-by-250-mm) Samples for each type of finish, and the following:
   1. Exposed hardware, for each type of item.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For casework.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete and dry, and temporary HVAC system is operating and maintaining temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.

C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.

1.6 COORDINATION

A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

PART 2 - PRODUCTS

2.1 CABINETS

A. Basis of Design: Subject to compliance with requirements, provide UltraStor storage cabinets by Wenger Corporation, or comparable products by one of the following:
   1. LSI Corporation of America.
   2. TMI Systems Design.
   3. Sidney Millwork.
   4. Stevens Cabinet Company.
   5. John Murphy Millworks.

6. R&R Millwork.
7. Johnson Brothers Planing Mill, Inc. (208) 522-3674.
8. Westmark Products, Inc.,
9. Eggli Brothers Millwork, Inc., of Lander, WY.
10. Maloney, Inc., of Sioux Falls, SD.
11. JBD, Inc., of Sheridan, WY.

B. Size: Provide cabinets of the size and configuration indicated on the Drawings.

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
1. Grade: Products provided shall exceed standards specified by AWI Architectural Woodwork Standards for Custom grade.

B. Regional Materials: Cabinets shall be manufactured within 500 miles (800 km) of Project site.

C. Factory Finishing: Finish cabinets at factory. Defer only final touchup until after installation.

2.2 MATERIALS

A. Provide composite materials with no added urea formaldehyde products:

B. Particleboard: ANSI A208.1, minimum 43 lb/cubic foot density.

C. Particleboard Thermoset Panels: Particleboard finished with thermally-fused polyester surfacing on both sides meeting performance properties of NEMA LD 3 for VGS grade, edge-banded, including the following:
1. Surface Abrasion Resistance: Taber Wheel, 400 cycles, for solid colors.

D. Polyethylene Shelves: High-density, one-piece, blow-molded or polyethylene, with radiused front edge, for abuse-resistant shelves.

E. PVC Edge Banding: Radiused PVC extrusions, 3 mm thick.

2.3 CABINET HARDWARE

A. Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish.

B. Grille Doors: Bright basic steel wire, 5/16 and 3/16 inch (7.9 and 4.8 mm) diameter, with full 360 degree welds at T-joints.

C. Butt Hinges: 2-3/4 inch (70 mm), 5-knuckle steel hinges made from 0.090 inch (2.29 mm) thick metal, ANSI/BHMA A156.9, Grade 1, with powder-coated finish, through-bolted to door and side panels and welded to grille door frames. Provide 2 hinges on compartment doors, and 4 hinges on full-height doors.

D. Slide Latch: 0.105 inch (2.67 mm) min. thickness steel, with padlock eye, powder-coat finish, through-bolted to panel door and side panel and welded to grille door frames. Latches securely without padlock. Provide with clear plastic label holder with numbering system. Padlocks furnished by Owner.

E. Cabinet Levelers: Leveling glides with 3/8 inch (9.5 mm) diameter threaded steel rod in steel corner brackets, minimum two each per cabinet side, accessible from within unit, and concealed in completed installation.

F. Fasteners: Manufacturer-recommended fasteners as required for casework substrate and project performance requirements.

G. Finishes on Steel Sheet, Steel Wire, and Exposed Fasteners: Urethane-based electrostatic powder coating, color as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of casework.

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

3.2 INSTALLATION

A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

B. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.

C. Install cabinets level and plumb to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).

D. Fasten cabinets to adjacent units and to backing.

3.3 ADJUSTING AND CLEANING

A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 12 35 51

SECTION 12 46 33

WASTE AND RECYCLING RECEPTACLES

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. Waste and recycling receptacles.

B. Related Sections:
   1. Section 10 28 00 “Toilet, Bath and Laundry Accessories.”

1.3 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include the following:
   1. Construction details and dimensions.
   2. Material and finish descriptions.
   3. Features that will be included for Project.
   4. Manufacturer's warranty.

C. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.
   1. Approved full-size Samples will be returned and may be used in the Work.

D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
   1. Identify locations using room designations indicated.
   2. Identify products using designations indicated.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For waste and recycling receptacles to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain products from single source from single manufacturer.

1.6 WARRANTY

A. Manufacturer's standard form.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

B. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

C. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

D. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 WASTE AND RECYCLING RECEPTACLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide Valuta by Magnuson Group, or a comparable product by one of the following:
   1. Acceptable Substitution: See Section 01 60 00 Product Requirements.

B. Receptacles: 40 gal. capacity, Valuta VA1818L. Steel with rigid internal liner and integrated bag arms.
   1. Configuration: Provide one each receptacle for Waste, Paper, and Cans/Plastic/Glass, where indicated.

2.3 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled.

B. Finish: Powder coat.
   1. Different color for body and top, as selected by Architect from full range of manufacturer standard colors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions.

3.2 ADJUSTING AND CLEANING

A. Adjust for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 12 46 33

SECTION 12 61 00

FIXED AUDIENCE SEATING

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 fixed audience seating with the following:
   1. Floor-mounted chairs, with and without tablet arms.
   2. Power service to individual seat locations.
   ~~2.~~3. Removal of existing fixed seating and repair of floor surfaces in the Theater.

B. Related Requirements:
   1. Section 01 23 00 “Alternates.”

1.3 DEFINITIONS

A. Tablet Arm: A flat surface attached to a chair that has the primary function to support tasks such as writing and short-term reference-material handling.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of components, and finishes for fixed audience seating.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Seating Layout: Show seating layout, aisle widths, aisle-end alignment or stepping, row-lettering and chair-numbering scheme, chair widths, and chair spacing in each row.
   2. Accessories: Show locations and features of accessories, including left- and right-hand tablet arms, and accessibility provisions.

C. Samples for Initial Selection: For each type of exposed color, finish, texture, and pattern indicated.
   1. Include Samples of accessories involving color and finish selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Chair Unit: Full-size unit of each type and combination of finishes.
   2. Power Service Devices: Full-size units.
   ~~2.~~3. Row-Letter and Chair-Number Plates: Full-size units with letters and numbers marked.
   ~~3.~~4. Exposed Fasteners: Full-size units of each type.

1.6 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of fixed audience seating.

B. Material Certificates: For each type of flame-retardant treatment of fabric.

C. Field quality-control reports.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fixed audience seating to include in operation and maintenance manuals.
   1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
      a. Maintenance of self-rising seat mechanisms, folding armrests, and other operating components.

b. Adjustment of self-rising seat mechanisms to align seats.
c. Maintenance of electrical components, devices, and accessories.
d. Methods for maintaining upholstery fabric.
e. Precautions for cleaning materials and methods that could be detrimental to seating finishes and performance.

1.8 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.

B. Provide 12 complete sets of replacements parts, including but not limited to:
1. Chair Seats and Backs.
2. Upholstered, Slip-on Cushions.
3. Tablet Arms: left- and right-hand mounted.
4. Armrests.
5. Power Receptacles.
~~5.~~6. Chair Seat Hinges.
~~6.~~7. Operating hardware.

1.9 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, demonstrate aesthetic effects, and set quality standards for fabrication and installation.
1. Build mockup of two typical seats, with and without tablet arm.
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 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of fixed audience seating that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Structural failures including standards, beams, and pedestals.
b. Faulty operation of self-rising seat mechanism.
c. Faulty operation of electrical components.
d. Wear and deterioration of fabric and stitching beyond normal use.
e. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
2. Warranty Periods: As follows, from date of Substantial Completion.
a. Structural: Lifetime.
b. Operating Mechanisms: Ten years.
c. Plastic, Wood, and Paint Components: Ten years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. "Basis-of-Design Product: Subject to compliance with requirements, provide seating by KI, Inc. per the below seating schedule, or a comparable product by Hussey Seating Company or Irwin Seating Company. Seating schedule:
1. Seating for Theater. Concerto Auditorium Seating. Reference Drawings for seating that receives G1 tablet arms. Non-electrified.
2. Seating for Health Classroom. Sequence Seating, Intellect Wave Collection, nonupholstered seat, with G2 tablet arm. Reference Alternate No. 23 for electrification.
3. Seating for Lecture Halls. Sequence Seating, Strive Collection, upholstered seat, with G2 tablet arm. Reference Alternate No. 23 for electrification.

B. American Seating is an acceptable manufacturer, provided this manufacturer can demonstrate the product construction precisely matches or exceeds the product construction of the specified manufacturer.

~~2.1~~2.2 MATERIALS, GENERAL

A. Source Limitations: Obtain each type of seating required, including accessories and mounting components, from single source from single manufacturer.
   1. Upholstery Fabric: Obtain fabric of a single dye lot for each color and pattern of fabric required.

~~2.2~~2.3 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics of Upholstered Chairs:
   1. Fabric: Class 1 according to DOC CS 191-1953 or 16 CFR 1610, tested according to California Technical Bulletin 117.
   2. Padding: Comply with California Technical Bulletin 117.

B. Strength and Durability Performance: Chairs and components shall pass testing according to BIFMA X5.4.

~~2.3~~2.4 ~~FIXED AUDIENCE~~ THEATER SEATING

A. Fixed Audience Seating: Assembly-space seating in permanent arrangement as shown on Drawings.

~~B. Basis-of-Design Product: Subject to compliance with requirements, provide Concerto Auditorium Seating by KI, Inc. or a comparable product by one of the following:~~
   ~~a. Hussey Seating Company.~~
   ~~b. Irwin Seating Company.~~

~~C.~~B. Chair Mounting Standards: Floor attached of the following material:
   1. Steel: One-piece, heavy-tube or reinforced sheet with welded mounting plate and welded connections for seat pivots, backs, armrests, and end panels.

~~D.~~C. Fabric Upholstered Chairs:
   1. Back:
      a. Urethane foam pad 2 inches (51 mm) thick bonded to 7 ply ~~1/16~~ 7/16 inch molded plywood back.
      b. Outer Back Surface: Molded plastic seat shroud, with concealed fasteners.
   2. Seat:
      a. Urethane foam pad 2 inches (51 mm) thick bonded to 7 ply ~~1/16~~ 7/16 inch molded plywood board with waterfall.
      b. Seat Bottom: Molded-plastic acoustical shell.
         1) Perforated shell with shaped foam inner-layer.

~~E.~~D. Chair Width: Vary chair widths to optimize sightlines and row lengths, with minimum chair width of 19 inches (483 mm) from center to center of armrests.

~~F.~~E. Back Height: Standard-style backs, 34 inches high.

~~G.~~F. Back Pitch: Fixed.
   1. Back Angle: Different angles within manufacturer's available range, for optimum viewing comfort at each location: 16 degrees, 20 degrees, and 24 degrees.

~~H.~~G. Chair Seat Hinges: Self-lubricating, with noiseless self-rising seat mechanism passing ASTM F 851, manual operation, positive internal stops cushioned with rubber or neoprene, and requiring no maintenance.
   1. Self-Rising Seat Mechanism: Gravity actuated, full fold.

~~I.~~H. Armrests: Molded plastic with concealed mounting.

~~J.~~I. Tablet Arms: Manufacturer's standard large size, 202 sq. in. of surface area, foldaway tablet arm with plastic-laminate writing surface over medium-density fiberboard or plywood core and with rounded, matching PVC edges.
   1. Mounting: Right-hand mounted unless otherwise indicated.
   2. Fold-Away Mechanism: Cast-iron or steel hinge and swivel mechanism that give positive support in open position and semiautomatic return to stored position below arm block and parallel to chair.

~~K.~~J. Accessible Seating:
   1. Provide removable chair for each wheelchair space unless otherwise indicated.

~~L.~~K. Row-Letter and Chair-Number Plates: Manufacturer's standard.

~~M.~~L. Accessibility-Logo Plates: Manufacturer's standard.

~~2.4~~2.5 MATERIALS AND FINISHES

A. Composite Wood Products: Products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
   1. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
   2. Concealed Plywood: HPVA HP-1 hardwood plywood or DOC PS 1 softwood plywood as standard with manufacturer.
   3. Exposed Plywood: HPVA HP-1, Face Grade A, hardwood-veneer core with color-matched hardwood-veneer faces.

B. Plastic Laminate: NEMA LD 3, Grade VGS for vertical surfaces and Grade HGS for horizontal surfaces.
   1. Color and Pattern: As selected by Architect from manufacturer's full range.

C. Molded Plastic: High-density polyethylene or polypropylene, blow or injection molded, with surface that is mar and dent resistant.
   1. Provide with UV inhibitors to retard fading.
   2. Color and Texture: As selected by Architect from manufacturer's full range.

D. Fabric: Manufacturer's standard with flame-retardant treatment.
   1. Color and Pattern: As selected by Architect from Pallas Textile's P1 grade fabric full range.

E. Upholstery Padding: Flexible, cellular, molded or slab polyurethane foam.

F. Metal Finish: Finish exposed metal parts with manufacturer's standard baked-on powder coating.
   1. Color: As selected by Architect from manufacturer's full range.

~~2.5~~2.6 FABRICATION

A. Floor Attachments: Fabricate to conform to floor slope so that standards and pedestals are plumb and chairs are maintained at same angular relationship to vertical throughout Project.

B. Upholstery: Fabricate fabric-covered cushions with molded padding beneath fabric and with fabric covering free of welts, creases, stretch lines, and wrinkles. For each upholstered component, install pile and pattern run in a consistent direction.
   1. Bond fabric to foam cushions using C-Gex methods.

C. Power Service Package: Manufacturer's standard service to each seat position, including terminal devices and wiring with 18 inches (457 mm) of extra length and as follows:
   1. Power Receptacles: 120 V with wiring and duplex receptacle.
   2. Location: Manufacturer's standard location.

PART 3 - EXECUTION

3.1 DEMOLITION

A. Remove existing fixed seating and repair concrete floors and risers.

3.2 EXAMINATION

A. Examine floors, risers, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Verify that HVAC air-distribution locations are correct.

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

3.3 INSTALLATION

A. Install seating in locations indicated and fasten securely to substrates according to manufacturer's written installation instructions.
   1. Install fixed audience seating with each chair capable of complying with performance requirements without failure or other conditions that might impair the chair's usefulness.
   2. Install standards and pedestals plumb.

3. Install seating so moving components operate smoothly and quietly.

B. Install seating with end standards aligned or stepped as indicated from first to last row and with backs and seats varied in width and spacing to optimize sightlines.

C. Install chairs in curved rows at a constant radius.

D. Install wiring conductors and cables concealed in components of seating and accessible for servicing.

1. Connect electrical service at junction-box locations according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Inspect components, assemblies, and equipment, including connections, to verify proper, complete, and sturdy installation according to manufacturer's written instructions and product specifications.
2. Verify that seats return to correct and uniform at-rest position.
3. Test power receptacles as specified in Section 26 27 26 "Wiring Devices" when power is activated.

B. Fixed audience seating will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.5 ADJUSTING

A. Adjust chair backs so that they are at proper angles and aligned with each other in uniform rows.

B. Adjust hardware and moving parts to function smoothly so they operate easily. Lubricate bearings and sliding parts as recommended in writing by manufacturer.

C. Adjust self-rising seat mechanisms so seats in each row are aligned when in upright position.

D. Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.

E. Replace damaged and malfunctioning components that cannot be acceptably repaired.

F. Replace upholstery fabric damaged during installation or work of other trades.

END OF SECTION 12 61 00

SECTION 12 66 00

TELESCOPING STANDS

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. Wall-attached telescoping stands.
   2. Portable/Movable telescoping stands.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design telescoping stands, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Telescoping stands shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ICC 300.

1.4 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for telescoping stands.

C. Shop Drawings: For telescoping stands in both stacked and extended positions. Include plans, elevations, sections, details, and attachments to other work.
   1. Wiring Diagrams: For power, signal, and control wiring.

D. Samples for Initial Selection: Full range of colors available for factory-applied finishes.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Decking: 6-inch- (150-mm-) square Samples of finished material.
   2. Metal Components: 6-inch- (150-mm-) square Sample of each color and finish indicated.
   3. Seating: 6-inch- (150-mm-) square Sample of each seating material, color, and finish indicated.
   4. Fabric: 12-inch- (300-mm-) square Sample of fabric from dye lot to be used for the Work, with specified treatments applied.
   5. Signage: Full-size units for row letters and each type of accessibility sign.

F. Delegated-Design Submittal: Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Welding certificates.

C. Product Certificates: For each type of flame-retardant treatment of fabric, from manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For inclusion in operation and maintenance manuals.
   1. Precautions for cleaning materials and methods that could be detrimental to telescoping stand finishes and performance.
   2. Methods for maintaining upholstery fabric.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," and AWS D1.3, "Structural Welding Code - Sheet Steel."

C. 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.

D. Standard: Provide telescoping stands to comply with ICC 300.

E. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

F. Preinstallation Conference: Conduct conference at Project site.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings and construction contiguous with telescoping stands by field measurements before fabrication. Verify locations of walls, columns, and other construction that will interface with operating telescoping stands.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood:
   1. Lumber: Kiln dried, surfaced four sides; southern pine complying with SPIB's "Standard Grading Rules for Southern Pine Lumber" for B&B Finish (B and better) grade-of-finish requirements.
   2. Plywood: APA-grade trademarked, DOC PS 1 A-C Exterior Grade that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Steel:
   1. Structural-Steel Shapes, Plates, and Bars: ASTM A 36/A 36M.
   2. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.
   3. Uncoated Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold-rolled commercial steel), or ASTM A 1011/A 1011M, Designation CS (hot-rolled commercial steel).
   4. Tubing: ASTM A 500, cold formed; ASTM A 501, hot formed; or ASTM A 513, mechanical.

C. Extruded Aluminum: ASTM B 221 (ASTM B 221M), alloy as standard for manufacturer.

D. Polyethylene Plastic: High-density polyethylene; molded, color-pigmented, textured, impact-resistant, structural formulation.

2.2 TELESCOPING STANDS

A. General: Operable systems of multiple-tiered seating on interconnected folding platforms that close, without being dismantled, into a nested stack for storing. Stand units permit opening and closing of adjacent rows, allow individual and collective rows to be locked open for use, and close with vertical faces of upper skirts on the same vertical plane.
   ~~A.~~1. Provide power and data outlets at the leading edge of the stands, where indicated.

B. Wall-Attached Telescoping Stands: Forward-folding system, in which the bleachers open in the forward direction by initially moving the front row away from the stack to the fully extended position, and the rear of bleacher understructure is permanently attached to wall construction.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Maxam26 Series Telescopic Gym Seat System manufactured by Hussey Seating Company, or comparable product by one of the following:
      a. Interkal LLC.
      b. Irwin Telescopic Seating Company.
      c. Kodiak Seating System by Royal Stewart Ltd.

2. Row Spacing: 26 inches.
    a. 21-1/8" clear foot space area, minimum.
3. Row Rise: 9 5/8 inches.
4. Front Row: 17 inches in height.
5. Operation: Automatic integral power electric.
    a. Limit Switches: Automatically stop integral power system when telescoping stands reach fully opened or closed positions.
    b. Motion Monitor: Flashing light with self-contained warning horn, rated at 85 dB at 10 feet (3 m), mounted under telescoping seating for audio and visual warning during integral power operation.
    c. Transformer: As required to coordinate current characteristics of motor and control station with building electrical system.
    d. Remote Control: Portable pendant control system.

C. Portable Telescoping Stands: Portable telescoping sections designed for transport and deployment in multiple locations. Forward-folding, in which the bleachers open in the forward direction by initially moving the front row away from the stack to the fully extended position.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Maxam26 Series Telescopic Gym Seat System manufactured by Hussey Seating Company, or comparable product by one of the following:
    a. Interkal LLC.
    b. Irwin Telescopic Seating Company.
    c. Kodiak Seating System by Royal Stewart Ltd.
2. Row Spacing: 26 inches.
    a. 21-1/8" clear foot space area, minimum.
3. Row Rise: 9 5/8 inches.
4. Front Row: 17 inches in height.
5. Operation: Manual.
6. Integral Dolly transport system.

D. Telescoping Stands Assemblies: Three banks of similar construction.
1. Base Condition:
    a. Main Gym East and Main Gym West, each:
        1) Wall attached.
        2) Overall Length: 100 feet (99' plus 1' of railing on one side).
            a) Section Length: Determined by the manufacturer, as required to satisfy requirements.
        3) Aisles: Two intermediate aisles, 4'-6" wide each.
        4) Number of Tiers: 13.
        5) Capacity, based on 18 inch wide seats: 780.
    b. Auxiliary Gym:
        1) Portable.
        2) Overall Length: 72 feet (70' plus 1' railing on each end).
            a) Section Length: Determined by the manufacturer, as required to satisfy requirements.
        3) Aisles: Two intermediate aisles, 4'-6" wide each.
        4) Number of Tiers: 8.
        5) Capacity, based on 18 inch wide seats: 302.
2. Enhancement Condition:
    a. Main Gym East and Main Gym West, each:
        1) Wall attached.
        2) Overall Length: 103 feet (102' plus 1' of railing on one side).
            a) Section Length: Determined by the manufacturer, as required to satisfy requirements.
        3) Aisles: Six aisles, 4'-6" wide each at ends and 4'-10 ½" wide intermediate.
        4) Number of Tiers: 24.
        5) Capacity, based on 18 inch wide seats: 1,160.

b. Auxiliary Gym:
1) Relocate bleachers form the existing school.

2.3 COMPONENTS

A. Benches: Seats and skirts.
1. Material: Molded polyethylene plastic with contour surfaces and integrally molded end caps at aisle end locations.
a. Integrally molded recess pockets to accept seat number and row letters.
b. Color: As selected by Architect from manufacturer's standard of not less than 15 colors.
1) A total of two bench colors will be selected for this project.
2. Attachment: 12 gauge steel clamp brackets, through bolted attachment to the front nose beam of the bleacher.
3. Bench Height: 16 inches minimum.
4. Bench Depth: 10 inches minimum.
5. Backs: None.

B. Wheelchair-Accessible Seating:
1. Flex-Row: Provide first row modular recoverable seating units to be utilized by persons in wheelchairs and able-bodied persons. Each Flex-Row unit shall have an unlock handle for easy deployment if wheelchair or team seating access is needed. Unlock handle shall lock the bleacher seats into position when fully opened.
2. Locate Flex-Row units where indicated to provide wheelchair-accessible seating.
3. Provide black full-surround steel skirting.
4. Provide black injection molded end cap for the nose beam.

C. Deck: Plywood, 5/8 inch (16 mm) thick, with tongue-and-groove joints.
1. Finish: Transparent, high-gloss polyurethane.

D. Risers: Steel sheet or tubular steel, with hot-dip galvanized finish.

E. Safety Rails: Structural steel, finished with manufacturer's standard powder coat system.
1. Self-storing mid-aisle handrails located at centerline of each vertical aisle with seating on both sides.
2. End rails (guards) that are telescoping and self-storing.
3. Back rails (guards) along rear of units where required by referenced safety standard.
4. Removable rails around accessible seating.
5. Removable, programming-support front rails to allow seating in upper rows while lower rows remain in the stored position.
6. Color: As selected by Architect from manufacturer’s full range of not less than 15 colors.

F. Understructure:
1. Structural steel, with deck stabilizer, sway bracing, and anti-drift features.
2. Finish: Manufacturer's standard two-coat alkyd-enamel rust-inhibiting finish.
a. Color: Black.

G. Support Column Wheels: Nonmarring, soft, rubber-face wheel assembly under each support column.
1. Include wheels of size, number, and design required to support stands and operate smoothly without damaging the flooring surface, but no fewer than four per column or less than 5 inches in diameter and 1 ¼ inch wide.

H. Fasteners: Vibration proof, in manufacturer's standard size and material.

2.4 TRANSPORT SYSTEMS

A. Integral Mechanical Dollies for portable sections: Provide one pair of machine-screw-jack dollies (per section) for transport of movable telescopic sections.
1. Dollies are integral to each section and shall be operated by a cordless drill through access holes in either the front or rear of the section. Dollies shall be designed to engage front and rear structural steel lift beams.

2. Each dolly shall be fitted with six 6 inch, 360 degree swiveling “kingpinless” casters to ensure ease of telescopic section movement. Wheel treads shall be molded polyurethane bonded to cast iron with roller bearing hubs.

2.5 ACCESSORIES

A. Steps:
   1. Slip-resistant, abrasive tread nosings at vertical aisles.
   2. Intermediate aisle steps, fully enclosed, at each vertical aisle.
   3. Transitional top step, fully enclosed, at each vertical aisle where last row of telescoping stands is adjacent to a cross aisle.
   4. Front Aisle Steps: Provide at each vertical aisle location front aisle step, fully enclosed.

B. Closure Panels and Void Fillers:
   1. Aisle closures at foot level that produce flush vertical face at aisles when system is stored.
   2. Panels at cutouts and truncations for accessible seating.
   3. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
   4. Gap fillers for closing openings between stand units or between stand units and adjoining construction.

C. Vinyl End Closure Curtain:
   1. Provide closure curtains fabricated of vinyl-coated 14oz Polyester fabric on open ends of telescopic seating. Curtains to be permanently attached to wall or rear closure panel and secured to individual rows of seating. Curtain to open with seating unit into taught secure configuration and fold automatically as seating unit closes.
   2. Curtain to have high resolution graphic logo or photograph located across entire visible surface area of the end curtain.

D. Signage:
   1. Row letters at each row end.
   2. Seat numbers at 18 inches (457 mm) o.c. on benches.
   3. Accessibility signs at each accessible space.

E. Scorer's Table: Provide one removable scorer’s table for each telescoping stands location.
   1. Attaches to mounting sockets installed in telescoping stand unit.
   2. Size: 8 foot by 18 inches.

2.6 FABRICATION

A. Fabricate understructure from structural-steel members in size, spacing, and form required to support design loads specified in referenced safety standard.

B. Weld understructure to comply with applicable AWS standards.

C. Round corners and edges of components and exposed fasteners to reduce snagging and pinching hazards.

D. Provide polymer end caps on understructure where exposed to spectator.

E. Form exposed sheet metal with flat, flush surfaces, level and true in line, and without cracking and grain separation.

F. Seating Supports: Fabricate supports to withstand, without damage to components, the forces imposed by use of stands without failure or other conditions that might impair the usefulness of seating units.
   1. Cantilever bench seat supports to produce toe space uninterrupted by vertical bracing.

G. Provide metal end deck cover on each row to cover exposed edge of plywood at the ends of the bleachers.

H. Provide metal cover over motor chains and wheels to protect chains from debris and provide a safety switch that if cover is taken off the power system will not work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where telescoping stands are to be installed, 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

A. Install telescoping stands to comply with referenced safety standard and manufacturer's written instructions.

B. Install portable stands to location indicated on the Drawings.

3.3 ADJUSTING AND CLEANING

A. On completion of installation, lubricate, test, and adjust each telescoping stand unit so that it operates according to manufacturer's written operating instructions.

B. Clean installed telescoping stands on exposed and semiexposed surfaces. Touch up shop-applied finishes or replace components as required to restore damaged or soiled areas.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain telescoping stands.

END OF SECTION 12 66 00

SECTION 12 93 13

BIKE RACKS

PART 1 GENERAL

1.1 SUMMARY

A. Bidding Documents and Information, Conditions of the Contract and Division 1 - General Requirements apply to the Work of this Section of the Specifications.

B. Section Includes:
1. Bike Racks

1.2 RELATED SECTIONS

A. Section: Concrete.

1.3 SUBMITTALS

A. General Requirements: Section 0133 00.

B. Shop Drawings: Indicate pertinent dimensions, materials, and anchorage.

1.4 DELIVERY, STORAGE AND PROTECTION

A. General Requirements: Section 01 65 00.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Observe environmental precautions based on conditions.

0.1 QUALITY ASSURANCE

A. Materials and installation shall conform to the requirements of all authorities having jurisdiction.

PART 2 PRODUCTS

2.1 BIKE RACKS

A. Belson Heavy Duty Challenger Wave Bike Rack: Model # CHP-11-IG-P, in ground mount, Color: Lexington Green, with grout covers. 9 loop/11 bikes rack. Bleson.com

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that conditions are satisfactory for installation of Bike Racks

B. Do not begin installation until unsatisfactory conditions are corrected

3.2 INSTALLATION OF BIKE RACKS

A. Install Bike Rack in the location identified in the drawing plans and detailed sections.

B. Secure in position securely anchored to concrete paving as recommended by manufacturer and as detailed herein.

C. Install as per manufacturer's instruction for an in ground mount, taking care to insure the proper installation of surrounding pavement.

D. Make certain that the bike rack is plumb at installation.

3.3 SITE PROTECTION AND CLEAN UP

A. Contractor is responsible for protecting newly installed equipment from disturbances to the footing until said footing has had time to properly set.

B. Contractor is responsible for cleaning and maintaining the site on a daily basis.

END OF SECTION

SECTION 12 9343

SITE SEATING, TABLES and TRASH RECEPTACLES

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 work of this section.

1.2 SUMMARY

A. Section Includes:
1. Site Seating, Tables and Trash Receptacles

1.3 PROTECTION:

A. Protect landscaping and other features remaining as final work.

B. Protect existing structures, fences, sidewalks, utilities, paving, curbs and other site appurtenances.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Landscape Forms, Inc., 431 Lawndale Avenue, Kalamazoo, Michigan 49048. Toll Free (800) 521-2546. Phone (269) 381-0396. Fax (269) 381-3455. Website www.landscapeforms.com. E-mail: specify@landscapeforms.com.

2.2 BENCHES (7)

A. “Parc Vue” Benches

B. Style:
1. Backed with Arms
2. Depth: 25-3/4 inches.
3. Overall Height: 35-1/2 inches.
4. Arm Height: 27-1/4 inches.

C. Length: 72 inches.

D. Mounting:
1. Surface mounted

E. Color: Sliver

2.3 SITE SEATING AND TABLES (7)

A. “Carousel” Tables

B. Seating:
1. Height: 17 inches.

C Style:
1. Perforated Metal
2. Backless

D. Number of seats:
1. 5, spaced to allow 1 open seat for wheelchair accessible

C. Tabletop:
1. Diameter: 42 inches.
2. Height: 29 inches.

E. Style:
1. Steelhead

D. Dimensions:

1. Outside Dimensions of Opposite Seats:
a. Backless: 81 inches.

E. Mounting:
1. Surface mounted

F. Color: Olive Green

2.4 RECPTACLES

A. Plexus II Trash Receptacles with Lid

B. Surface Mount

C. Color: Powdercoated Silver

2.3 MATERIAL

A. Benches:
1. End Frames: ¾" thick steel plate.
2. Center Tubes: Tubes between end frames are 1-1/2" outer diameter x 0.120" wall steel tube.
3. Profile Rods: Three profile rods welded along the length of the bench to hold the shape of the seat. These rods are formed from ½" diameter steel
4. Divider: Divider is made of 319 sand cast aluminum.
5. Seat Slats: 1-1/2" x 0.188" steel, slats and stretcher tubes are perimeter welded to the end frames to provide excellent strength and rust prevention.
6. Mounting:
   a. Surface Mount: Surface mount units have type 304 stainless steel anchor tabs installed
7. Anchor Bolts: Corrosion resistant recommended (not supplied by manufacturer)

B. Tables:
1. Seats:
   a. Perforated Metal: 14 gauge steel panel with 1/4-inch square holes on 7/16-inch straight centers. Welded in 7/8-inch O.D. by 0.120-inch-wall tubular steel frame.
   b. Table Top:
      Steelhead: Set in 1-1/2-inch O.D. tubular frame reinforced with steel channels beneath top.
      -Solid Insert: 14-gauge steel
      -Perforated Insert: 12-gauge steel, 1/4-inch square holes on 7/16-inch straight
   c. Supports: Steel Tubing: 2-inch O.D. by 0.120-inch wall thickness.
   d. Anchor Bolts: Corrosion resistant recommended, not supplied by the manufacturer.

C. Trash Receptacles:
1. Receptacle Body: Formed of wire grid panel of 5/16" frame and bars 2-1/2" o.c. with 1/8" cross wires ½" o.c. inserted in a 7/8" outer diameter, 0.065" wall thickness steel ring. Litter receptacle front has hinged door that swings open for litter removal.
2. Lids: Constructed of 14-guage spun metal. Lid is permanently welded to unit.
3. Liners: Constructed of molded polyethylene. Color coordinates with powdercoat color.
4. Anchor Bolts: Corrosion resistant recommended, not supplied by the manufacturer.

PART 2 - EXECUTION

2.1 EXAMINATION:

A. Examine the site prior to installation to determine the suitability of the timing of the installation. Do not start the installation until the site is acceptable.

2.2 INSTALLATION

A. Secure in position by securely anchoring to concrete paving as recommended by manufacturer and as detailed herein.

2.3 SITE PROTECTION AND CLEAN UP

A. Contractor is responsible for protecting newly installed equipment from disturbances to the footing until said footing has had time to properly set.

B. Contractor is responsible for cleaning and maintaining the site on a daily basis.

END OF SECTION

SECTION 14 21 00

ELECTRIC TRACTION ELEVATORS

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. Machine roomless (MRL) gearless elevators.
   2. Materials and accessories required for a complete, operational elevator installation, including pit ladder.

B. Related Requirements:
   1. Section 01 23 00 “Alternates” for MRL Hydraulic elevators as bid alternates.
   2. Section 01 50 00 "Temporary Facilities and Controls" for temporary use of elevators for construction purposes.
   3. Section 03 30 00 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
   4. Section 04 20 00 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
   5. Section 05 12 00 "Structural Steel Framing" for the following:
      a. Attachment plates, angle brackets, and other preparation of structural steel for guide-rail brackets.
      b. Hoist beams.
   6. Section 05 50 00 "Metal Fabrications" for the following:
      a. Structural-steel shapes for subsills.
   7. Section ~~09 65 16 “Resilient Flooring”~~ 09 68 13 “Carpeting” for finish flooring in elevator cars.
   8. Section 22 14 29 "Sump Pumps" for sump pumps, sumps, and sump covers in elevator pits.
   9. Section 27 15 00 "Communications Horizontal Cabling" for telephone service for elevators.
   10. Section 28 31 11 "Digital, Addressable Fire-Alarm System" and for connection to elevator controllers.

1.3 DEFINITIONS

A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.

1.4 ACTION SUBMITTALS

A. General: Architect’s material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data: 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.
   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- (75-mm-) square Samples of sheet materials; and 4-inch (100-mm) lengths of running trim members.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and control closet layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
   1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

C. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard two-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.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

B. Pre-Installation Meeting:
   1. Review schedule of installation, installation procedures and conditions, and coordination with related work.
   2. Review use of elevator for construction purposes, hours of use, scheduling of its use, cleanliness of cab, employment of operator, maintenance of system.

1.8 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.

1.9 COORDINATION

A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of other work relating 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.

1.10 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: two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements and all specifications of this Section, provide Kone "EcoSpace" or comparable product by one of the following:
   1. ThyssenKrupp Elevator.
   2. Submittal for comparable product shall include full coordination with Base Bid structure, finishes and services. Changes required for incorporation of the comparable product shall be described in detail, and cost for changes shall be included in the bid price.

B. Source Limitations: Obtain elevators from single manufacturer.
   1. Major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.

B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

C. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and shall comply with elevator safety requirements in ASME A17.1/CSA B44.
   1. Seismic Risk Category: as indicated in the structural general notes.
   2. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
   3. Affected peak velocity acceleration (Av) for Project's location is greater than or equal to 0.10, but less than 0.20 (seismic risk Zone 2).
   4. Provide earthquake equipment required by ASME A17.1/CSA B44.
   5. Provide seismic switch required by ASCE/SEI 7.

2.3 ELEVATORS

A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.

B. Elevator Description - **F103**
   1. Stops/Landings: Three.
   2. Rated Load: 2500 lb (1135 kg).
   3. Rated Speed: 150 fpm.

C. Elevator Description - **H**
   1. Stops/Landings: Two.
   2. Rated Load: 3500 lb (1135 kg).
   3. Rated Speed: 150 fpm.

D. Machine Location: Hoistway; no machine room is provided.

E. Machine Type: Gearless traction.

F. Operation System: Selective-collective automatic operation.

G. Auxiliary Operations:
1. Battery-powered lowering.
2. Automatic dispatching of loaded car.
3. Loaded-car bypass.

H. Security Features: Card-reader operation ~~Keyswitch operation~~.

I. Car Enclosures:
1. Inside Width: 80 inches (2032 mm) from side wall to side wall.
2. Inside Depth: 51 inches (1295 mm) from back wall to front wall (return panels).
3. Inside Height: 94 inches (2388 mm) to underside of ceiling.
4. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
5. Car Fixtures and Controls: Satin stainless steel – KSS 140.
6. Side and Rear Wall Panels: Plastic laminate – Asian Night 7949-38.
7. Ceiling Panels: Stainless steel with square LED lighting – LF-97.
8. Reveals: Enameled steel.
9. Door Faces (Interior): Satin stainless steel, No. 4 finish.
10. Door Sills: Aluminum, mill finish.
11. Handrails: 3 ~~inche~~inch flat satin stainless steel, No. 4 finish, at sides and rear of car.
12. Floor prepared to receive carpet (specified in Section 09 68 13 “Carpeting.”) ~~resilient flooring (specified in Section 09 65 16 "Resilient Flooring")~~.

J. Hoistway Entrances:
1. Width: 42 inches (1067 mm).
2. Height: 84 inches (2134 mm).
3. Type: Single-speed center opening.
4. Frames: Satin stainless steel, No. 4 finish.
5. Doors: Satin stainless steel, No. 4 finish.
6. Sills: Aluminum, mill finish.

K. Hall Fixtures: Satin stainless steel, No. 4 finish.

L. Additional Requirements:
1. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.

2.4 TRACTION SYSTEMS

A. Elevator Machines: Variable-voltage, variable-frequency, ac-type hoisting machines and solid-state power converters.
1. Provide regenerative system.
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. 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.

C. Machine Beams: Provide framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 05 12 00 "Structural Steel" for materials and fabrication.

D. Car Frame and Platform: Bolted- or welded-steel units.

E. Guides: Roller guides. Provide guides at top and bottom of car and counterweight frames.

2.5 OPERATION SYSTEMS

A. General: Provide manufacturer's standard microprocessor operation systems as required to provide type of operation indicated.

B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
1. Group Battery-Powered Lowering: If power fails, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered one at a

time to the next floor below, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.

C. Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.

1. ~~Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at car-control stations and hall push-button stations~~.

2. Card-Reader Operation: System uses proximity readers at hall push-button stations 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 proximity readers, other security access system equipment, and elevator controllers. Provide proximity reader integral with each car-control station.

   a. Security access system is specified in Section 28 13 00 "Access Control."

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2.6 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 shall cause 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 shall sound and doors shall begin to close at reduced kinetic energy.

2.7 CAR ENCLOSURES

A. General: Provide enameled-steel car enclosures to receive removable wall panels, with 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. Colors: Selected by Architect from manufacturer's full range, except as indicated otherwise.
2. Subfloor: Exterior, underlayment grade plywood, not less than 5/8-inch (15.9-mm) nominal thickness.
3. Fabricate car with recesses and cutouts for signal equipment.
4. Fabricate car door frame integrally with front wall of car.
5. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
6. Sight Guards: Provide sight guards on car doors.
7. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
8. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
9. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.8 HOISTWAY ENTRANCES

A. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall 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 hour.

2.9 SIGNAL EQUIPMENT

A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life lamps and acrylic or other permanent, non-yellowing translucent plastic diffusers.

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.

D. Firefighters' Two-Way Telephone Communication Service: Provide flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Section 28 31 11 "Digital, Addressable Fire-Alarm System."

E. Car Position Indicator: Provide 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.

F. Hall Push-Button Stations: Provide one hall push-button station at each landing.
1. Provide manufacturer's standard wall-mounted 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.
3. Equip units with buttons for calling elevator and for indicating direction of travel or destination as required by system. Provide a signaling system to verify floor selection, where destination registration is required, and to direct passengers to appropriate car.
   a. Provide a means for passengers to indicate that they have disabilities so control system can allow extra room in assigned car.
   b. Provide for connecting units that require destination registration to building security access system so a card reader can be used to register calls.

G. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.

H. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed.

I. Fire-Command-Center Annunciator Panel: Provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch (es), as required by ASME A17.1/CSA B44, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.

J. 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.

2.10 ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Electrical Characteristics:
1. 480 volts, three phase, 60 Hz.
2. 35 amperes maximum fuse size.

2.11 WORK BY GENERAL CONTRACTOR

A. The General Contractor shall provide the following:
1. A legal hoistway, properly framed and enclosed, and including a pit of proper depth provided with ladder, sump pump, lights, access doors, ground fault outlet with guard, and waterproofing as required. A separate branch circuit must supply the lights and outlet. Lighting shall not be connected to the load side terminals of a GFCI receptacle. A legal control room, with self-closing, self-locking door, adequate for the elevator equipment, including floors, lighting and ventilation. Light fixture shall be provided at the

top of the hoistway to provide 200 lumens (19 footcandles). Provide and install smoke detectors in the control room and hallways in front of elevators. If hoistways are sprinkled, a smoke detector is required at the top of the hoistway. If hoistway or control room is sprinkled, provide and install a shunt trip system located in the elevator control room.

2. Adequate supports and foundations to carry the loads of all equipment including supports for guide rail brackets and machine beams or overhead beams or overhead sheaves
3. Cutting of walls, floors, etc., and removal of such obstructions as may be necessary for proper installation of the elevator. Setting of anchors and sleeves. Pockets or blockouts for signal fixtures.
4. Complete 3 phase connections from the electric power mains to each controller including necessary circuit breakers and fused mainline disconnect switches.
5. All sill supports, including steel where required, and sill recesses and grouting of door sills. Finishing of walls after hoistway frames are installed.
6. Structural steel doors frames with extensions to beam above if required on hoistway sides and sills for freight elevators, including finish painting of these items.
7. Provide and maintain temporary enclosures or other protection from open hoistways during the time elevator is being installed.
8. Proper trenching and backfilling for any underground piping or conduit.
9. Guide rail bracket inserts provided by Elevator Contractor and installed by General Contractor.
10. A means to automatically disconnect the main power supply to the elevator prior to the application of water in the elevator control room will be furnished by the Electrical Contractor. This means shall not be self-resetting.
11. Suitable connections from the power mains to each controller or motor generator set starter, signal equipment feeders as required, including necessary circuit breakers. Fused mainline disconnect switches, with over current protection, shall be located in elevator controller room and be lockable in “OFF” position. Shunt trip switch to assure elevator cannot move under battery backup power.
12. Wiring to controller for car lighting and ventilation. Electric power of the same characteristics as the permanent supply, without charge for construction, testing and adjusting.
13. Wiring and conduit from life safety panel or any other monitor station to elevator machine room.
14. Heat and smoke sensing devices at elevator lobbies on each floor with electrical conductors terminating at a properly marked panel in the elevator control closet.
15. Telephone connection to elevator hoistway (instrument by Owner).
16. Wiring from elevator hoistway to outside alarm bell as required by the Safety Code for Elevators and Escalators (ANSI/ASME A17.1).
17. Emergency power supply with automatic time delay transfer switch and auxiliary contacts with wiring to the elevator controller.
18. Any required safety provisions not directly involved in the elevator installation.
19. All painting, except as otherwise specified.
20. Controller room shall be ventilated.
21. Temporary elevator service prior to completion and acceptance of complete installation.
22. Grounding of hoistway frames.
23. Furnishing, installation and maintaining the required fire rating of elevator hoistway walls, including the penetration of fire wall by elevator fixture boxes.
24. Adequate storage facilities for elevator equipment prior to and during installation at ground level within 150 feet of hoistway.
25. When the hoistway is sprinkled, all electrical equipment located less than 4 feet above the pit floor shall be:
    a. Weatherproof per NEMA 4.
    b. Wiring shall be identified for use in wet locations.
26. Provide and install a dedicated separate 110V disconnect switch and outlet, per elevator, lockable in “OFF” position, for control closet lighting.

27. A pit drain or sump pit with flush grating is required and may not be connected to sewers. Pump must be connected to a hose that will reach an adjoining corridor. Grate shall be flush with pit floor. Sump pit switch shall be a maximum of 4 feet 4 inches above floor of pit and located near light switch and ladder. Sump pump outlet to be located near sump pit.
28. Provide 1 fire extinguisher in the control room per Section 10 44 13 requirements.
29. Provide 1 sign outside the Elevator Equipment Room per section 10 14 23 requirements, copy to read: "Elevator Equipment Room." (Verify with Owner if room number is to be included.)

2.12 FINISH MATERIALS

A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.

D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

E. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

F. Plastic Laminate: High-pressure type complying with NEMA LD 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

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 (3 mm), 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. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
2. Place hall lanterns either above or beside each hoistway entrance.
3. Mount hall lanterns at a minimum of 72 inches (1829 mm) 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. Operating Test: Load elevator to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.

C. 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: No permitted.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevators.

B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

END OF SECTION 14 21 00

SECTION 14 42 00

WHEELCHAIR LIFTS

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. Indoor inclined platform lifts, including steel support ~~posts~~ for ~~tower~~ wall mount.
~~1.~~2. Portable platform lift.

B. Related Requirements:
1. Section 05 51 00 "Metal Stairs."
2. Section 28 31 15 "Addressable Fire Alarm System" for integration of the wheelchair lift.
3. Division 26 – Electrical.

1.3 DEFINITIONS

A. Definitions in ASME A18.1 apply to Work of this Section.

1.4 ACTION SUBMITTALS

A. General: Architect's material and color selection can be made only from samples. Material and color selection will not be made based on printed or electronic literature.

B. Product Data:
1. Include construction details, material descriptions, dimensions of individual components, and finishes for lifts.
2. Include rated capacities, operating characteristics, electrical characteristics, safety features, controls, finishes, and accessories.

C. Shop Drawings:
1. Include plans, elevations, sections, details, attachments to other work, and required clearances.
2. Indicate dimensions, weights, loads, and points of load to building structure.
3. Include details of equipment assemblies, method of field assembly, components, and location and size of each field connection.
4. Include diagrams for power, signal, and control wiring.

D. Samples for Initial Selection: For surfaces and components with factory-applied color finishes.
1. Include Samples of integrally colored materials and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Certificates:
1. Include statement that runway, ramp or pit, dimensions as shown on Drawings, and electrical service as shown and specified are adequate for lift being provided.

C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lift to include in operation and maintenance manuals.
1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
a. Parts list with sources indicated.
b. Recommended parts inventory list.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted use of lifts.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer with demonstrable successful experience manufacturing wheelchair lifts for not less than 10 years.

B. Installer Qualifications: An authorized representative of the manufacturer.
   1. Trained by manufacturer, and authorized service contractor.
   2. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

1.8 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of lifts that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Five years for drive train.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

B. Regulatory Requirements: Comply with:
   1. ASME A18.1, Safety Standard for Platform Lifts and Stairway Chairlifts.
   2. ASME A17.5 - Elevator and Escalator Electrical Equipment.
   3. NFPA 70 - National Electric Code.

2.2 INCLINED PLATFORM LIFT

A. Inclined Platform Lift, Preengineered lift system, straight lift mounted on one flight of straight stairway.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Garaventa Lift model Xpress II, or comparable product by one of the following:
      a. Savaria Concord Lifts.
      b. Acceptable Substitution: See Section 01 60 00 Product Requirements.

B. Number of Stops: Two.

C. Platform Size: 800mm by 1250mm minimum.

D. Platform Load Rating: 495 lbs, with minimum safety factor of 5.

E. Rated Speed: 13 fpm minimum.

F. Power Supply: 208-240 VAC, 60 Hz, one phase.
   1. Connect to building emergency power system.

G. Drive and Guide Rail System:
   1. Drive:
      a. Motor: ¾ hp minimum, with integral brake.
      b. Worm gear reduction to pinion moving on a fixed gear rack.
      c. Frequency inverter.
      d. Mechanical stop and secondary limit switches to stop the lift in the event of failure of the primary limit switch.
   2. Guide Rail System:
      a. Two part guide rail system, mounted to ~~steel support posts~~wall.

H. Platform: Aluminum floor plate with nonskid surface texture.
   1. Ramp: Retractable ramp matching platform to provide transition from floor to lift platform. Ramp lowers to floor automatically when lifts reach landing. Ramp rises automatically when lift control is activated for lift to leave landing.
      a. Provide boarding sides of platform with retractable ramps positioned for travel at a height of 6 inches (150 mm) measured vertically above platform deck.
      b. Provide on the non-boarding and non-guide rail side of the platform a sidewall of not less 6 inches (150 mm) in height, measured vertically from the platform deck.

c. When the platform is folded, sidewall shall cover the platform controls, providing protection from vandalism.

I. Platform Operation:
1. Automatic Fold: Folded and unfolded electrically from the call station.
2. Emergency Manual Fold: When left in the open position, platform may be manually folded and retained in the closed position.
3. Automatic Folding Platforms: When not in use, platforms shall automatically fold up against wall to minimize projection into stairway.

J. Under Platform Obstruction Sensing:
1. Provide under-platform sensing device to stop platform from traveling in the downward direction when encountering 4 lb/f (20 N) of pressure.
2. Platform is permitted to travel in the opposite direction of the obstruction to allow clearing.

K. Passenger Restraining Arms:
1. Platform equipped with retractable passenger restraining arms in compliance with ASME A18.1a.

L. Clearances Dimensions:
1. Platform shall not protrude more than 10-1/4 inches (260 mm) from the mounting surface when folded and stored.
2. Platform shall not protrude more than 40-1/4 inches (1020 mm) from the mounting surface when unfolded and in use.

M. Controls:
1. Keyed operation.
2. 24 VDC Low Voltage type.
3. Emergency stop switch within reach of passenger.
4. Provide surface mounted call stations at both landings.

N. Emergency Operation: Provide manual operation to raise or lower units in case of malfunction or power loss.

O. Support to Structure: Provide framing and brackets to support loads from ~~floor or stair treads~~wall. Fabricate framing and brackets from stainless-steel rectangular tubing, plates, shapes, and bars.

P. Accessories: Provide units with the following accessories:
1. Fold-down seat with seatbelt, rated to minimum load of 250 lbs.
2. Caution sign as required by ASME A18.1.

Q. Additional Safety or Code Requirements:
1. Building Fire Alarm Integration: Coordinate with 28 31 15 “Addressable Fire Alarm System” to connect the lift control system with the building fire alarm system. If the lift is not in operation when the building fire alarm system is activated power will be cut to the lift preventing use during fire evacuation. If the lift is in use when the building fire alarm system is activated, the lift shall only allow the passenger to travel to the designated landing with the emergency exit.
~~2. Provide perforated metal plate at the support-side of the lift to prevent objects larger than 4 inches in diameter from passing through the railing.~~

2.3 INCLINED LIFT 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. Design and fabricate lift to manufacturer's standard design for indoor locations.
1. Aluminum guide rails and ramps to be anodized aluminum. Steel components shall be painted with electrostatically applied and baked powder coat as follows:
a. Color selected by Architect from RAL color chart.

2.4 PORTABLE PLATFORM LIFTS

A. Portable Platform Lifts: Portable lifting device consisting of a platform supported on an electro-hydraulic lifting mechanism with built-in casters for portability, and no machine tower, designed for independent use and compliance with ADA. The casters shall permit easy movement of the unoccupied lift over hard, level surfaces.

B. Product: Ascension Virtuoso 5460P Model Series vertical portable wheelchair lift, manufactured by Ascension, 3526 E. Fort Lowell Rd., Tucson, AZ, 85716, Tel: 800-459-0400 or 520-881-3993, Fax: 520-881-4983, sales@wheelchairlift.com.

C. Physical Characteristics
1. Lifting capacity: 750 pounds.
2. Weight of lift: 1025 pounds maximum.
3. Vertical speed: seven (7) fpm (feet per minute).
4. Vertical travel: 12" to 60", infinitely adjustable.
5. Standard platform gate configuration: the upper landing platform gate shall be left-hinged when facing the lift from the upper landing; the lower landing platform gate shall be right-hinged when facing the lift from the lower landing.

D. Dimensions
1. Platform size: 36" x 54" with 43" high sidewalls and platform gates.
2. Space requirements (operational, storage, and transport): 44" high (in the down position), 66" long, 48" wide.
3. No part of the lift shall stand over 44” high when the platform is on the ground (with the exception for when the optional stage guard is being used).

E. Materials
1. The platform, base frame, and lifting device shall be constructed from ASTM A 36, AISI 1018, or AISI 1020 Steel.
2. The windows shall be fabricated from 1/4" thick high impact strength clear thermoplastic.
3. The safety skirt shall be constructed from rigid plastic.

F. Finish
1. Exposed metal surfaces shall be finished with an oven-baked powder coating.
2. Color: Black.

G. Drive: direct-acting hydraulic.

H. Electrical Requirements
1. 120VAC, 60 hertz, single phase, 15 amp service.
2. The lift shall be supplied with a three prong grounded electrical cord (20' in length).
3. The lift shall contain a Ground Fault Circuit Interrupter (GFCI).
4. The hydraulic pump shall be directly coupled to a capacitor start 1/2 hp motor.
5. Other than the motor, all control and operating circuits shall be serviced by a 12 VDC solid state linear power supply.
6. Electrical components shall be UL listed and CSA registered.
7. Electrical system shall be certified to ASME A17.5 by an independent testing laboratory.

I. Safety Devices: The lift shall be constructed to meet the applicable requirements of ADAAG, ASME A17.1-1996 or older (PART XX, SECTION 2000), ASME A18.1, and ANSI A117.1 as they would apply to a portable lifting device. The lift shall include the following safety features for protection of the passenger and general public.
1. Grounded electrical system.
2. 12 VDC operating controls.
3. Constant pressure operating switches.
4. Emergency stop button at passenger control station.
5. Electro-mechanical interlock to prevent accidental opening of lower landing platform gate.
6. Gate switches to prevent platform movement if either platform gate is open.
7. Lift platform stop height switch.
8. Safety skirt that completely encloses and protects the area under the lift platform.
9. 43" high sidewalls and platform gates.
10. Unobstructed view through transparent sidewalls and platform gates.

11. Grab bar extending full length of inside wall.
12. Slip resistant surfaces on platform floor and dock plate.
13. Structural safety factors as specified in ASME A18.1.
14. Self-closing platform gates.

J. Portability: Casters shall be easily attached to the platform for portability and stored in the base frame when not in use. Casters shall be 3½" in diameter and fabricated from hard rubber. The casters shall be capable of being installed without tools. When the casters are installed, the lift shall roll easily over any hard, smooth, level surface. The lift shall be capable of being moved by fork lift or truck.

K. Operating Characteristics
1. Lift shall include three (3) constant pressure “UP/DOWN” switches, located outside of the platform at both ends and inside the platform.
2. The passenger control station shall be provided with a separate “PUSH TO STOP” emergency button. The emergency stop button shall lock when pushed and require manual reset before operation can resume.
3. The platform stop height shall be adjustable without the use of tools.
4. Opening the upper landing platform gate shall deploy a dock plate that rests on the upper landing surface. The dock plate shall provide a smooth transition between the platform and the upper landing. Closing the upper landing platform gate shall retract the dock plate.
5. The lower landing platform gate shall be provided with a mechanical interlock that prevents the platform gate from being opened whenever the platform is more than 2" above the full down position.

L. Compression Capability
1. The lift shall be capable of being compressed to 33" wide to facilitate relocation through a 36" wide doorway.
a. Provide manufacturer’s tool kit.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, critical dimensions, and other conditions affecting performance of the Work.

B. Minimum Headroom Clearance: Verify that installed lift will have a minimum headroom of 80 inches (2032 mm) above any point on platform floor at any point of travel.

C. Verify required supports are correct.

D. Verify electrical rough-in is at correct locations.

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

3.2 INSTALLATION

A. General: Comply with ASME A18.1 and manufacturer's written instructions for installation of lifts unless otherwise indicated.

B. Wiring Method: Conceal conductors and cables within housings of units or building construction. Do not install conduit exposed to view in finished spaces. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

C. Adjust stops for accurate stopping at each landing, within required tolerances.

D. Adjust retractable ramps to meet maximum allowable slope and change-in-elevation requirements, and to lie fully against landing surfaces.

E. Lubricate operating parts of lift, including drive mechanism, guide rails, hinges, safety devices, and hardware.

F. Test safety devices and verify smoothness of required protective enclosures and other surfaces.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of lift installation and before permitting use of lifts, perform acceptance tests as required and recommended by ASME A18.1 and authorities having jurisdiction.

B. Operating Test: In addition to acceptance testing, load lifts to rated capacity and operate continuously for 30 minutes between lowest and highest landings served. Readjust stops, signal equipment, and other devices for accurate stopping and operation of system.

C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on lifts.

3.4 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of lift Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper lift operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.

B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.

C. Check operation of lifts with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

END OF SECTION 14 42 00