CONTRACT DOCUMENTS
AND
SPECIFICATIONS
FOR
PROJECT NO. SP 22-7 TULSA POLICE
DEPARTMENT HELIPORT

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

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SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes hollow-metal work.
B. Related Requirements:
   1. Section 081416 "Flush Wood Doors" for wood doors installed in hollow-metal frames.

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

2.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

2.4 INFORMATIONAL SUBMITTALS
A. Product test reports.

PART 3 - PRODUCTS

3.1 MANUFACTURERS
A. Basis-of-Design Product: Subject to compliance with requirements, provide Steelcraft; an Allegion brand or comparable product by one of the following:
   1. Ceco Door; ASSA ABLOY.
   2. Curries Company; ASSA ABLOY.
   4. Republic Doors and Frames.
3.2 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-Lite 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.

3.3 INTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

   1. Physical Performance: Level B according to SDI A250.4.
   2. Doors:

      a. Type: As indicated in the Door and Frame Schedule.
      c. Face: Metallic-coated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
      d. Edge Construction: Model 2, Seamless.
      e. Core: Manufacturer's standard with sound insulation
      f. Fire Rated Doors
         1) Labeled
         2) Paris: Labeled without astragal.

   3. Frames:

      a. Materials: Metallic-coated, steel sheet, minimum thickness of 0.053 inch.
      b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.
      c. Construction: Full profile welded and ground smooth.
      d. Split type frames are not acceptable.
      e. Conceal fastenings.
      f. Steel boxes at back of hardware cut-outs, minimum 26 GA welded to frame.
      g. Fire rated: UL labeled, comply with NFPA-80.


3.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES


   1. Physical Performance: Level A according to SDI A250.4.
   2. Doors:

      a. Type: As indicated in the Door and Frame Schedule.
c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
d. Edge Construction: Model 2, Seamless.
e. Core: Manufacturer's standard insulation material.

3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.

4. Frames:
   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
   b. Construction: Full profile welded and ground smooth.
   c. Split type frames are not acceptable.
   d. Conceal fastenings.
   e. Steel boxes at back of hardware cut-outs, minimum 26 GA welded to frame.
   g. Exterior over 4 FT: Minimum 14 GA galvanized steel.
   h. Fire rated: UL labeled, comply with NFPA-80.

5. Exposed Finish: Factory Primed over A40 coating.

3.5 BORROWED LITES
   
   A. Hollow-metal frames of metallic-coated steel sheet, minimum 14 gauge.
   B. Construction: Full profile welded and ground smooth.

3.6 FRAME ANCHORS
   
   A. Jamb Anchors:
      1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
   
   B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
      1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

3.7 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 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: From corrosion-resistant materials.

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

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).

I. Glazing: Section 088000 "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

3.8 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. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Edges are to be seamless.
2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.

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. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by 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. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      1) Three anchors per jamb up to 60 inches high.
      2) Four anchors per jamb from 60 to 90 inches high.
      3) Five anchors per jamb from 90 to 96 inches high.
      4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
b. Compression Type: Not less than two anchors in each frame.
c. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
   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. 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.
   2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
   1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
   2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
   3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
   4. Provide loose stops and moldings on inside of hollow-metal work.
   5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

3.9 STEEL FINISHES
   A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

3.10 ACCESSORIES
   A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
   B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 4 - EXECUTION

4.1 INSTALLATION
   A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, 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.

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.

4. In-Place Metal or Wood-Stud Partitions: Secure drywall frames in place according to manufacturer's written instructions.
5. 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, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
   c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. 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 plus or minus 1/32 inch.
   b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
   c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.
   d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

C. Glazing: Comply with installation requirements in Section 088000 “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 o.c. and not more than 2 inches o.c. from each corner.

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

END OF SECTION
SECTION 081416
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door.

B. 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.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide VT Industries Inc.; or a comparable product by one of the following:

1. Algoma Hardwoods, Inc.
2. Eggers Industries.
3. Graham Wood Doors; ASSA ABLOY Group company.
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"

B. WDMA I.S.1-A Performance Grade:
   1. Heavy Duty unless otherwise indicated.
   2. Extra Heavy Duty: public toilets, janitor's closets, assembly spaces, and exits.

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. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
   2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
   3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

E. 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.

F. Structural-Composite-Lumber-Core Doors:
      a. Screw Withdrawal, Face: 700 lbf.
      b. Screw Withdrawal, Edge: 400 lbf.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:
   1. Grade: Premium, with Grade AA faces.
   2. Species: Red oak.
   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. Core: Particleboard, or Either glued wood stave or structural composite lumber.
8. Construction: Seven plies, either bonded or nonbonded construction.

2.4 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. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied.

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 in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.5 FACTORY FINISHING

A. 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.

B. Factory finish doors that are indicated to receive transparent finish.

C. Transparent Finish:

1. Grade: Premium.
2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 9, UV curable, acrylated polyurethane.
4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
5. Sheen: Satin.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Section 087100 "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.
2. Install smoke- and draft-control doors according to NFPA 105.

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 at heads, jambs, and between pairs of doors. Provide 1/8 inch 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 from bottom of door to top of threshold unless otherwise indicated.

   a. Comply with NFPA 80 for fire-rated doors.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

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

END OF SECTION
SECTION 083323
OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Insulated service doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
   1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
   2. Show locations of controls, locking devices, detectors or replaceable fusible links, and other accessories.
   3. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
   1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.
2.2 DOOR ASSEMBLY

A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide **Overhead Door Corporation: 625** or a comparable product by one of the following:
      
      a. **Cornell Iron Works, Inc.**

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.

C. Curtain R-Value: 7.7, U-Value 0.13.

D. Door Curtain Material: Galvanized steel.

E. Door Curtain Slats: Flat profile slats.
   1. Insulated-Slat Interior Facing: CFC-free foamed-in-place polyurethane.

F. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from hot-dip galvanized steel and finished to match door.

G. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.

H. Hood: Match curtain material and finish.
   1. Mounting: Face of wall As shown on Drawings.

I. Electric Door Operator:
   1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
   2. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use.
   5. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar.
   6. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.
   7. Control Station(s): Interior mounted.

J. Curtain Accessories: Equip door with weather seals.

K. Door Finish:
   1. Architect to select from manufacturer’s standard colors.

2.3 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2.4 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. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
   2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010 inch and minimum aluminum thickness of 0.032 inch.

B. 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.

2.5 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. 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. Exterior-Mounted Doors: Fabricate hood to act as weather protection and with a perimeter weather seals at jambs.

2.6 CURTAIN ACCESSORIES

A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.

B. 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.

2.7 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.

B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.
2.8 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, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
   1. Comply with NFPA 70.
   2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.

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

C. Motors: Reversible-type motor for motor exposure indicated.
   1. Electrical Characteristics:
      b. Volts: 115/230 V.
      c. Hertz: 60.
   2. 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. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
   3. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.

D. Obstruction Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening, activation of device immediately stops and reverses downward door travel.
   a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.

E. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" push-button control labeled "Close."
   1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.


G. 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.

H. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
2.9 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. Power-Operated Doors: Install according to UL 325.

C. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. Adjust seals to provide tight fit around entire perimeter.

2.10 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
SECTION 083419
HANGAR BI-PARTING BOTTOM ROLLING DOOR SYSTEM

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Provide a 80'-0" wide by 16'-0" high, 6-section, electrically operated, bi-parting, bottom rolling, top guided hangar door.

B. Includes the bottom rails, top guides, and door sections complete with bottom wheels, top guide rollers, electric motor operator with brake, electrical controls, draped cord electrical power feed, bumper pick-up system and weather seals. All steel is prime painted with the manufacturer’s standard structural primer.

C. Work by others includes preparation of the building to receive the hangar door, field wiring, field finish paint, top guide supports and exterior and interior metal sheeting and insulation.

1.2 DESIGN CRITERIA

A. Doors shall be designed to withstand a wind load of 25 pounds per square foot in the closed position. The top guide system shall be capable of accommodating a total of six (6) inches of live load deflection and five (5) inches of uplift.

1.3 SUBMITTALS

A. Design and submittal drawings shall be approved by the architect prior to hangar door fabrication.

B. Operation and maintenance manual shall be furnished to the owner.

1.4 DELIVERY STORAGE AND HANDLING

A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, so as to permit access for inspection and handling.

B. Handle materials carefully to prevent damage.

1.5 WARRANTY

A. The door manufacturer shall provide a written guarantee against all defects in material and workmanship for a period of one year from the date of acceptance.

PART 2 - PRODUCTS
2.1 APPROVED MANUFACTURERS

A. Door Engineering and Manufacturing – 101 Power Drive, Mankato, MN 56001, (800) 959-1352
   1. Basis of Design: Model HB600 Bi-Parting Door

B. Or approved equal.

2.2 MATERIALS

A. All door section framing members, both vertical and horizontal, shall be hot rolled standard structural steel sections equal to or exceeding ASTM A-36 and comply with AISC specifications. Cold formed "C", "Z" shapes may be used for girts or bracing.

B. Door section construction: Door sections shall be fabricated in sizes convenient for shipping and shall be of bolted and/or welded construction. Framing members shall be true to dimension and square in all directions. Diagonal bracing shall be provided so that the completed door section assembly will be adequately braced to withstand operational loads.

C. Weather seals on vertical edges, sill and head are attached at the factory. Vertical weather seals are a bulb type sheet rubber EPDM (Ethylene, Propylene, Diene, Terpolymer) with a resilient urethane foam core. Vertical opposing bulb weather seals between the door sections shall seal against each other and not come in contact with the door sheeting. Head and sill weather seals are flap type sheet rubber EPDM (Ethylene, Propylene, Diene, Terpolymer). All weather-seals shall be retained with full length steel binding strips attached with rust resistant fasteners.

D. Telescoping top guide rollers: Each door section shall be equipped with two telescoping top guide roller assemblies consisting of horizontal and vertical steel rollers with oil impregnated bronze bearings.

E. Bottom wheels: Each door section shall have two double flanged solid steel wheels with a minimum tread diameter of 12 inches. Each wheel shall be equipped with tapered roller bearings capable of transmitting both vertical and horizontal loads. Bearings shall be provided with grease seals.

F. Top guide assemblies: Top guide assemblies consisting of wide flange beams and cross bracing shall be factory fabricated sub-assemblies to accommodate the telescoping top roller assemblies and the designed building live load deflection and uplift.

G. Bottom rails: Bottom rail assemblies shall be factory fabricated sub-assemblies from a minimum ASCE 20 lbs. / yd. bottom rail with cross bracing and include leveling anchors.

2.3 OPERATING SYSTEM

A. The bi-parting hangar door shall be operated by an electric motor drive system mounted internally within the door framing of the leading door sections 3 and 4. The electric motor operator shall drive one of the bottom wheels of the door section. The non-powered door sections to be interconnected to the powered door section by means of a neoprene cushioned mechanical bumper pick-up system.

2.4 ELECTRIC OPERATOR
A. The electric motor operator shall consist of a factory installed electric brake motor, gear reducer, required sprockets, roller chains and chain tensioning devices. The operator shall be capable of emergency manual operation. Electric power shall be 208, 230 or 460 VAC, 60 Hz, three phase.

2.5 ELECTRIC CONTROLS

A. Electrical controls shall include a factory wired enclosure with disconnect switch, overload and under voltage protection, magnetic reversing starters, and control voltage transformer mounted on the powered door section. Control circuits shall not exceed a nominal 110 volts.

B. A control station of constant pressure with "OPEN" and "CLOSE" pushbuttons shall be factory mounted near the leading edge of the power operated door section.

C. Limit switches shall be provided to stop the travel of the door sections in their fully open or fully closed positions. Limit switches shall be factory mounted on the powered door section. Actuating cams shall be field mounted on the top guide assemblies.

D. Electric power shall be brought to the powered door section with a multi conductor SO electrical cable draped from the jamb of the door opening and the non-powered door sections to the powered door section.

E. All electrical wiring from the electric motor operator internal to the powered door section shall be factory wired in conduit to a junction box near the top of the door section.

PART 3 - EXECUTION

3.1 PAINTING

A. Clean all steel surfaces after fabrication. Steel surfaces painted with manufacturer’s standard structural primer.

B. Paint per specification 0991133 Exterior Painting. Color to be selected from manufacturer’s full range.

3.2 INSTALLATION

A. Assemble and install the bottom rail assemblies, top guide assemblies and door sections in accordance with approved drawings and installation instructions. All door openings, roof and floor shall be completely installed prior to the installation of the door. Permanent or temporary electric wiring shall be brought to the door opening before installation is started.

B. Door shall be set plumb, level and square, and with all parts properly fastened, mounted, etc. All moving parts shall be tested and adjusted and left in good operating condition.

3.3 ADJUSTING AND CLEANING
A. Inspection of the doors and complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.

B. Clean surfaces and repaint abraded or damaged primed surfaces to match factory-applied finish.

END OF SECTION
SECTION 084113
ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Aluminum-framed storefront systems.
   2. Aluminum-framed entrance door systems.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
   1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
   2. Include point-to-point wiring diagrams.
C. Samples: For each type of exposed finish required.
D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
E. Delegated Design Submittal: For aluminum-framed entrances and storefronts, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS
A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.
B. Product test reports.
C. Source quality-control reports.
D. Field quality-control reports.
E. Sample warranties.

1.4 CLOSEOUT SUBMITTALS
A. Operation and maintenance data.
1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installers: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.
2. Delegated Design Engineer: A professional engineer who is legally qualified to practice in where Project is located and who is experienced in providing engineering services of the type indicated.

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.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked-enamel, powder-coat, or organic finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Warranty Period: 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. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Failure also includes the following:
   a. Thermal stresses transferring to building structure.
   b. Glass breakage.
   c. Noise or vibration created by wind and thermal and structural movements.
   d. Loosening or weakening of fasteners, attachments, and other components.
   e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.

C. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.

2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

D. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

F. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):
   a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.41 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
   b. Entrance Doors: U-factor of not more than 0.68 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):
a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.35 as determined in accordance with NFRC 200.
b. Entrance Doors: SHGC of not more than 0.35 as determined in accordance with NFRC 200.

3. Air Leakage:

a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft. when tested in accordance with ASTM E283.
b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

4. Condensation Resistance Factor (CRF):

a. Fixed Glazing and Framing Areas: CRF for the system of not less than 35 as determined in accordance with AAMA 1503.
b. Entrance Doors: CRF of not less than 57 as determined in accordance with AAMA 1503.

G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STOREFRONT SYSTEMS

A. Manufacturers:
   1. Kawneer
   2. YKK

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

2. Interior Vestibule Framing Construction: Thermally broken.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
7. Steel Reinforcement: As required by manufacturer.
8. Kawneer Trifab 601T.

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.
2.3 ENTRANCE DOOR SYSTEMS

A. Manufacturers:
   1. Kawneer
   2. YKK

B. Entrance Doors: Manufacturer’s Heavy Wall glazed entrance doors for manual-swing or automatic operation.
   1. Door Construction: 2-inch overall thickness, with minimum 3/16 inch thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
      a. Thermal Construction: Thermally broken design.
   2. Kawneer 500 Heavy Wall Swing Door.
   3. Door Design: Wide stile; 5-inch nominal width.
      a. Provide nonremovable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in [Section 087100 "Door Hardware."] [Section 087111 "Door Hardware (Descriptive Specification).""]

B. General: Provide entrance door hardware and [entrance door hardware sets indicated in door and frame schedule] [entrance door hardware sets indicated in "Entrance Door Hardware Sets" Article] for each entrance door, to comply with requirements in this Section.
   1. Entrance Door Hardware Sets: Refer hardware schedule.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
   3. Opening-Force Requirements:
      a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
      b. Accessible Interior Doors: Not more than 5 lbf to fully open door.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing,"
B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Structural Profiles: ASTM B308/B308M.

D. Steel Reinforcement:
   1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
   2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
   3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fitted joints with ends coped or mitered.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing from interior and exterior for vision glass and exterior for spandrel glass or metal panels.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

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

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.8 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm] or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:
   1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
   2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.
3.2 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 088000 "Glazing."

3.3 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

A. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections: 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 in accordance with AAMA 501.2 and shall not evidence water penetration.
   a. Perform a minimum of two tests in areas as directed by Architect.
2. Egress Door Inspections: Inspect each aluminum-framed entrance door equipped with panic hardware, each aluminum-framed entrance door located in an exit enclosure, each electrically controlled aluminum-framed egress door, and each aluminum-framed entrance door equipped with special locking arrangements, in accordance with NFPA 101, Section 7.2.1.15.

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

C. Prepare test and inspection reports.

END OF SECTION
SECTION 084513
TRANSLUCENT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for translucent wall system as shown and specified herein.

1.2 WORK INCLUDED

A. Design, engineer, manufacture, and installation of unitized double glazed insulated translucent curtain wall system.

B. All anchors, brackets, and hardware attachments necessary to complete the specified structural assembly, weatherability, and water-tightness performance requirements. All flashing up to but not penetrating adjoining work are also required as part of the system and shall be included.

C. Trained and factory authorized labor and supervision to complete the entire panel installation.

1.3 QUALITY ASSURANCE

A. The glazing panels must be evaluated and listed by recognized building code evaluation organization: International Council Evaluation Service Inc (ICC-ES).

B. Materials and products shall be manufactured by a company continuously and regularly employed in the manufacturing, engineering, and designing, stocking and building of unitized translucent curtain walls for a period of at least ten (10) years.

C. Erection shall be by a factory-approved installer who has been in the business of erecting similar material for at least five (5) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope, and type.

D. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system, in accordance with the requirements of this specification.

1.4 SUBMITTALS

A. Submit Shop drawings and color samples.

B. Manufacturer shall submit written guarantee accompanied by substantiating data, stating that the products to be furnished are in accordance with or exceed these specifications.

C. Manufacturer shall submit full warranty terms and conditions for verification of compliance with the requirements of this specification.
D. Submittal: For glazing assemblies indicated to comply with performance requirements and design criteria.

E. The manufacturer shall submit certified test reports made by an independent organization. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed reports will be acceptable if they are indicative of the products used on this project. Test reports required are:
6. Tests on a weathered system after approximately 10 years of actual exposure in Florida field conditions. Test shall include:
7. Weather evaluation before and after exposure to 300°F for 25 minutes. Include light transmission and color change (ASTM E-1175 and ASTM D-2244, respectively).
8. Large missile Test – Impact resistance (SFBC PA 201-94).
10. Insulation U-Value for Center of Glazing (NFRC 100).
11. Insulation U-Value for System, glazing and aluminum framing (NFRC 100 and 700 Certification).
13. Solar Heat Gain Coefficient (SHGC) based on tests or calculations which are based on tests per methodology and procedure given in the NFRC/Calorimeter Standard.
14. Maximum Air Infiltration Rate for fenestration assemblies of curtain walls, (NFRC 400 or ASTM E-283).
15. Water Penetration (ASTM E-331).
20. Sound Transmission Loss (STC) per ASTM E413

1.5 MAINTENANCE DATA

A. The manufacturer shall provide recommended maintenance procedures, schedule of maintenance and materials required or recommended for maintenance.

B. Submit installer certificate signed by installer, certifying compliance with project qualification requirements.

1.6 WARRANTY
A. Provide a single source translucent wall system manufacturer warranty against defective materials and fabrication. Submit manufacturer’s written warranty agreeing to repair failures in materials within one (1) year from date of installation.

B. Provide the following single source curtain wall manufacturer glazing warranties. Third party warranties shall not be acceptable. All warranties shall be maintained without the requirement for periodic re-application of a UV-stabilizing exterior coat. The expected humidity of the enclosed space shall not affect warranty length or limitations.
   1. Provide a lifetime warranty for both interior and exterior glazing covering:
      a. Delamination of the glazing from the internal structure.
      b. Fiberbloom; development of a rough exterior surface.
   2. Provide a ten (10) warranty on the interior and exterior glazing panels covering:
      a. Change in light transmission of no more than 6% per ASTM D-1003.
      b. Color stability: interior glazing shall not change color more than 6 CIE Units DELTA E by ASTM D-2244.
      c. Blue light spectrum (400-470nm) measured in accordance with ASTM E-1175 shall not decrease by no more than 6% after ten years in comparison with the original value.

C. In addition, submit installer’s written warranty agreeing to repair installation workmanship, defects and leaks within one year from date of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of design
   1. The design and performance criteria of this job are based on the UniQuad – Translucent Wall System - as manufactured by Kingspan Light + Air | Architectural Daylighting
      a. Phone: (800) 759-6965; Website: www.kingspanlightandair.us

B. Approved Manufacturers
   1. Other manufacturers may bid this project provided they comply with all requirements of the specification and submit evidence of compliance with all performance criteria specified herein. This evidence must include proof of conformance and test reports per section 1.4. Any exceptions taken from this specification must be noted on the approval request. If no exceptions are noted and approval is given, product performance will be as specified.

C. Listing manufacturers’ names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.

2.2 TRANSLUCENT CURTAIN WALL PERFORMANCE AND APPEARANCE

A. Glazing construction for weatherability and resistance to buckling and pressure
   1. Translucent glazing must be constructed of polycarbonate with tight cell sizes not exceeding 0.18”. Wide cells of size greater than 0.18” shall not be acceptable.
   2. Glazing shall be factory sealed to restrict dirt ingress.
3. Glazing must be manufactured with a permanent, co-extruded ultra-violet protective layer. Post-applied coatings or films of dissimilar materials that need to be maintained are unacceptable.

4. The light transmission shall not decrease more than 6% as measured by ASTM D-1003 over 10 years, or after exposure to temperature of 300°F for 25 minutes (thermal aging performance standard).

5. Blue light spectrum (400-470nm) measured in accordance with ASTM E-1175 shall not decrease by no more than 6% after ten years in comparison with the original value.

6. The weathering performance should be justified by successful testing of the glazing’s performance after exposure to actual Florida weather conditions for approximately 10 years in comparison to a new glazing assembly. This performance must be demonstrated by providing independent lab test reports for the exposed and a new panel assembly for the following tests; test results must show that there is no deterioration in performance for the 10 year’s exposed panels versus new:
   a. Uniform static air pressure per ASTM E-330 at negative load of -105 PSF and positive load of 130 PSF.
   b. Impact loading of 500 ft lbs. per ASTM E-695.
   c. Cyclic static air pressure at 65 PSF and impact lever D per ASTM 1886 and ASTM E-1996.

7. Glazing shall not become readily detached when exposed to temperatures of 300°F and 0°F for 25 minutes.

8. Thermal aging – the interior and exterior glazing shall not change color in excess of 0.75 Delta E per ASTM D-2244 and shall not darken more than 0.3 units Delta L per ASTM D-2244 and shall allow no cracking or crazing when exposed to 300°F for 25 minutes.

B. Translucent glazing assemblies – Unitized Double Glazed
1. Design, engineer, manufacture, and installation of unitized double-glazed translucent wall system. An assembly of two independent insulated glazing panes in one integrated assembly, incorporated into a complete aluminum frame system that has been tested and warranted by the manufacturer as a single source system. Design shall provide for the replacement of the exterior glazing, independently of the interior glazing without exposing the building’s interior or compromising the weather tightness or interfering with the normal working functions of the building. Single pane glazing systems are not acceptable.

2. Overall glazing assembly thickness shall be a minimum 2.75”, with two glazing panes and concealed interlocking connector. Thickness of the exterior and interior glazing shall be minimum 8mm thick each.

C. Thermal and Solar Performance
1. To ensure Energy Code compliance, product U-Values must be listed in the NFRC Product Directory and have a NFRC Certified Product Directory (CPD) number.
   b. Center of glazing U-Value per NFRC 100: Maximum .23.
   c. System U-Value per NFRC 100 and 700 with a Mill finish: Maximum .28.
   d. Each unitized glazing assembly shall be thermally broken.
   e. Visible Light Transmission – Center of Glass (VT%) .24 Per ASTM E-972 and E-1084.
   f. Solar Heat Gain Coefficient (SHGC) 0.33 per NFRC Calorimeter.
   g. Haze measurement minimum of 90% per ASTM D-1003.
   h. Standard exterior glazing color: Ice White Matte
   i. Standard interior glazing color: Ice White Matte

D. Translucent Glazing Joint System
1. Water penetration: no water penetration of the glazing joint connection length at test pressure of 6.24 PSF per ASTM E-331.
2. Air Infiltration: pass requirements of NFRC 400 at 1.57 PSF and 6.24 PSF.
3. Free movement of the glazing shall be allowed to occur without damage to the weather tightness of the completed system.
4. The glazing joint shall comply with the deflection limitation of IBC Table 1604.3 for exterior walls with flexible finishes – L/120 per ASTM E-330.

E. Flammability
1. Exterior Glazing
   a. Class CC1 fire rating classification per ASTM D-635. Square foot and separation limitations provided in IBC Table 2607.4, any light transmitting plastic of a CC2 fire classification rating is specifically dis-allowed.
   b. Class A interior flame spread per ASTM E-84
   c. Flame spread no greater than zero (0) and smoke density no greater than 110 per ASTM E-84.
   d. Minimum self-ignition temperature of 1120° per ASTM 1929.

F. Impact Resistance
1. Minimum Impact resistance of 350 ft. lbs. per SFBC – PA 201-94.
2. Minimum Impact loading of 500 ft. lbs. per ASTM E-695.
3. Must comply with standard specification for performance of exterior windows or curtain walls when impacted by windborne debris at level D and after cyclic wind loading at the specified design load (ASTM E1996-02).

2.3 METAL FRAME STRUCTURE

A. Design criteria shall be per ASCE-7 requirements

B. The translucent wall light framing is designed to be self-supporting between the support constructions. The deflection of the glazing panel joint and system framing members in a direction normal to the plane of the glazing, when subjected to a uniform load deflection, shall not exceed L/120 for the unsupported span per IBC Table 1604.3. All adjacent and support construction must support the transfer of all loads included horizontal and vertical, exerted by the system. Design or structural engineering services for the supporting structure or building components in not included in the curtain wall scope of this section

C. All system aluminum framing exposed to the exterior shall be thermally broken.

D. Water penetration: the curtain wall system shall allow no water penetration at a minimum differential static pressure of 6.24 PSF per AAMA 501 pressure difference recommendations and as demonstrated by prior testing of typical framing sample per ASTM E-331

E. Water test of meal frame structure shall be conducted according to procedures in AAMA 501.2.

F. Maximum air infiltration rate for fenestration of the two glazing assemblies of curtain wall system shall be per NFRC 400.

2.4 METAL MATERIALS
A. Extruded aluminum shall be ANSI/ASTM B-221; 6063-T6 or 6005-T5.

B. Flashing:
   1. 5005 H34 Aluminum .040” thick
   2. Sheet metal sill flashings are to be furnished shop formed to profile - when lengths exceed 10ft, provide in nominal 10ft lengths. Field trimming of the flashing and field forming the ends is necessary to suit as-built conditions. Sheet metal ends are to overlap at least 6in to 8in, set in a full bed of sealant and riveted if required.

C. All fasteners for aluminum framing to be stainless steel or cadmium plated steel, excluding the final fasteners to the building.

D. All exposed Aluminum shall be finished:
   1. Anodized finish as per performance requirement 215 Class I Clear Anodized with 1yr warranty

PART 3 - EXECUTION

3.1 EXAMINATION

A. General contractor to verify when structural support is ready to receive all work in the section and to convene a pre-installation conference at least one week prior to commencing work of this section. Attendance required of the general contractor, curtain wall installer and all parties affecting and effected by the work of this section.

B. All submitted opening sizes, dimensions and tolerances are to be field verified by the general contractor unless otherwise stipulated.

C. Installer shall examine area of installation to verify readiness of site conditions. Notify the general contractor about any defects requiring correction. Do not work until conditions are satisfactory.

3.2 INSTALLATION

A. Install components in strict accordance with manufacturer’s instructions an approved shop drawings. Use proper fasteners, caulking and hardware for material attachments as specified.

B. Use methods of attachment to structure allowing sufficient adjustment to accommodate tolerances.

C. Remove all protective coverings on panels immediately after installation.

3.3 CLEANING

A. Follow manufacturer’s instructions when washing down exposed panel surfaces using a solution of mild detergent in warm water that is applied with soft, cleaning wiping cloths. Always test a small area before applying to an entire area.

B. Follow strict panel manufacturer guidelines when removing foreign substances from panel surfaces requiring mineral spirits or any solvents that are acceptable for use. Always test a small sample to validate compliance before applying to the entire glazing surface.
C. Installer shall leave glazing system clean at completion of installation. Final cleaning is by others upon completion of project, following manufacturer's cleaning instructions.

END OF SECTION
SECTION 087100  
DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:
   a. Swinging doors.
   b. Sliding doors.
   c. Gates.

2. Electronic access control system components, including:
   a. Biometric access control reader.
   b. Electronic access control devices.

3. Field verification, preparation and modification of existing doors and frames to receive new door hardware.
4. Lead-lining door hardware items required for radiation protection at door openings.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

   1. Windows
   2. Cabinets (casework), including locks in cabinets
   3. Signage
   4. Toilet accessories
   5. Overhead doors

C. Related Sections:

   1. Division 01 Section “Alternates” for alternates affecting this section.
   2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
   3. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
   4. Division 13 Section “Radiation Protection” for requirements for lead-lining for door hardware at openings indicated to receive radiation protection.
   5. Division 26 sections for connections to electrical power system and for low-voltage wiring.
6. Division 28 sections for coordination with other components of electronic access control system.

1.3 REFERENCES

A. UL - Underwriters Laboratories

UL 10B - Fire Test of Door Assemblies
   1. UL 10C - Positive Pressure Test of Fire Door Assemblies
   2. UL 1784 - Air Leakage Tests of Door Assemblies
   3. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute
   1. Sequence and Format for the Hardware Schedule
   2. Recommended Locations for Builders Hardware
   3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute
   1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

A. General:

   1. Submit in accordance with Conditions of Contract and Division 01 requirements.
   2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
   3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:

   1. Product Data: Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
   2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:

      a. Wiring Diagrams: For power, signal, and control wiring and including:

         1) Details of interface of electrified door hardware and building safety and security systems.
         2) Schematic diagram of systems that interface with electrified door hardware.
         3) Point-to-point wiring.
         4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.

   a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

   a. Door Index; include door number, heading number, and Architects hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.
   j. Name and phone number for local manufacturer’s representative for each product.
   k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.

   1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

   a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.

   1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
f. Prepare key schedule by or under supervision of supplier, detailing Owner’s final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product Certificates for electrified door hardware, signed by manufacturer:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Certificates of Compliance:
   a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
   b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in “QUALITY ASSURANCE” article, herein.
   c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in “QUALITY ASSURANCE” article, herein.
4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; 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. Final approved hardware schedule, edited to reflect conditions as-installed.
   f. Final keying schedule
   g. Copies of floor plans with keying nomenclature
   h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
1.5 QUALITY ASSURANCE

A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

1. Where specific manufacturer’s product is named and accompanied by “No Substitute,” including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

   a. Where no additional products or manufacturers are listed in product category, requirements for “No Substitute” govern product selection.

2. Where products indicate “acceptable manufacturers” or “acceptable manufacturers and products”, provide product from specified manufacturers, subject to compliance with specified requirements and “Single Source Responsibility” requirements stated herein.

B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

1. Warehousing Facilities: In Project’s vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. 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.
4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

   a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.

D. Architectural Hardware Consultant Qualifications: Person 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 and meets these requirements:

   1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
   2. Can provide installation and technical data to Architect and other related subcontractors.
   3. Can inspect and verify components are in working order upon completion of installation.
   5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at tested pressure differential of 0.3-inch wg of water.

H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

I. Means of Egress Doors: Latches do not require more than 15 lbf to release latch. Locks do not require use of key, tool, or special knowledge for operation.

J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf.
2. Maximum opening-force requirements:
   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
   b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
   c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches from latch, measured to leading edge of door.

K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.

2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Requirements for access control.
e. Address for delivery of keys.

L. Pre-installation 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. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

M. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
   a. Attendees: Door hardware supplier, door hardware installer, Contractor.
   b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
   a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Owner's security consultant, Architect and Contractor.
   b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
   1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:
1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

F. Deliver keys to Owner by registered mail or overnight package service.

1.7 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner’s security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
   a. Closers:
1) Mechanical: 30 years.

b. Automatic Operators: 2 year.
c. Exit Devices:

1) Mechanical: 3 years.
2) Electrified: 1 year.

d. Locksets:

1) Mechanical: 3 years.
2) Electrified: 1 year.

e. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

A. Maintenance Tools:

1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: “No Substitute.”

1. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors: Hardwired Electronic Access Control Lockset and Exit Device Trim:

1. Data: 24AWG, 4 conductor shielded, Belden 9843, 9841 or comparable.
2. DC Power: 18 AWG, 2 conductor, Belden 8760 or comparable.
3. Provide type of data and DC power cabling required by access control device manufacturer for this installation.
4. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with sufficient number and wire gauge with standardized Molex plug connectors to accommodate electric function of specified hardware. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series
2. Acceptable Manufacturers and Products: Hager, ABH, McKinney

B. Requirements:
1. Provide five-knuckle, ball bearing hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch thick doors, up to and including 36 inches (914 mm) wide:
1. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
2. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.

6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.

7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins

8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

9. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.

10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.

11. Provide mortar guard for each electrified hinge specified.

12. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.4 CONTINUOUS HINGES

A. Aluminum Geared
   1. Manufacturers:
      a. Scheduled Manufacturer: Ives.
   2. Requirements:
      a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
      b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
      c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
g. Install hinges with fasteners supplied by manufacturer.
h. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.5 CYLINDRICAL LOCKS

A. Manufacturers and Products:


B. Requirements

3. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, and UL Listed for 3-hour fire doors.
4. Cylinders: Refer to “KEYING” article, herein.
5. Provide locks with standard 2-3/4 inches backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
6. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
7. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
8. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   b. Tactile Warning (Knurling): Where required by authority having jurisdiction. Provide on levers on exterior (secure side) of doors serving rooms considered to be hazardous.

2.6 EXIT DEVICES

2.7 LOW PROFILE PUSH BAR EXIT DEVICES

A. Manufacturers and Products:


B. The maximum exit device projection shall be a maximum of 3-1/16” when activated. The exit device bar shall have an average minimum thickness of .201”. The push pad surface shall be constructed of stainless steel; push pads with plastic or Lexan coatings shall not be acceptable. Nylon bearings and stainless steel springs shall be used for long life and durability. Only torsion
or compression springs are acceptable. Extension type springs are not acceptable. All device
covers shall be of cast brass, deep drawn steel or stainless steel. Latchbolts shall be of stainless
steel and shall have a deadlocking latch for extra security, except at full-glass or two-light glass
doors requiring narrow stile device. Mounting screws shall be concealed to deter tampering. All
ferrous parts shall be zinc coated to prevent rusting.

C. Single point, one quarter turn hex dogging shall be standard on panic listed devices. Optional key
cylinder dogging shall be available, and furnished if so indicated in the hardware sets, on panic
listed devices. Devices with hex key dogging shall be easily field converted to cylinder dogging.

D. All devices shall be listed by Underwriters Laboratories for safety as panic hardware. Fire rated
devices shall be UL listed for A label and lesser class doors, 4' x 8' single and 8 x 8' pair. The
model number shall be located on the end cap; devices having the model number located other than
on the end cap shall not be acceptable.

E. All exit devices shall have a unitized installation feature and may be cut in the field to size. Devices
shall be closed on all sides with no pinch points. The push pad shall be designed to prevent pinching
of the fingers when depressed.

F. Exit Device trim to be through bolted. Lever trim to be heavy duty forged escutcheon with free-
wheeling levers.

G. All exit devices shall conform to Federal Specification FF-H-1820, and be certified as meeting
ANSI A156.3, Grade 1 requirements.

2.8 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage

B. Requirements:

1. Provide FSIC permanent cylinders/cores key system, compliant with ANSI/BHMA A156.5;
latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match
lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.
2. Replaceable Construction Cores.

   a. Provide temporary construction cores replaceable by permanent cores, furnished in
      accordance with the following requirements.

      1) 3 construction control keys
      2) 12 construction change (day) keys.

   b. Owner or Owner’s Representative will replace temporary construction cores with
      permanent cores.
2.9 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Provide cylinders/cores keyed into Owner's existing factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

C. Requirements:

1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
   
a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.

3. Provide keys with the following features:
   
a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   b. Patent Protection: Keys and blanks protected by one or more utility patent(s).

4. Identification:
   
a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Blind code marks shall not include actual key cuts.
   
b. Identification stamping provisions must be approved by the Architect and Owner.
   
c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   
d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
   
e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

5. Quantity: Furnish in the following quantities.
   
a. Change (Day) Keys: 3 per cylinder/core.
   c. Control keys: 3.

2.10 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee
2. Acceptable Manufacturers: HPC, Lund
B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
   
a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
b. Provide hinged-panel type cabinet for wall mounting.

2.11 DOOR CLOSERS

A. Manufacturers and Products:


B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action cast iron cylinder.
3. Closer Body: 1-1/4 inch (32 mm) diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Cylinder body to have “FAST” power adjust speed dial to visually indicate spring power.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.12 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Trimco

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.13 PROTECTION PLATES

A. Manufacturers:
   1. Scheduled Manufacturer: Ives
   2. Acceptable Manufacturers: Burns, Trimco

B. Requirements:
   1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
   2. Sizes of plates:
      a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
      b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
      c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.14 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturers: Glynn-Johnson

B. Requirements:
   1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
   2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
   3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against
equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.15 DOOR STOPS AND HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives
   2. Acceptable Manufacturers: Burns, Trimco

B. Provide door stops at each door leaf:
   1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
   2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
   3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.16 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:
   1. Scheduled Manufacturer: Zero International
   2. Acceptable Manufacturers: National Guard, Reese

B. Requirements:
   1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
   2. Size of thresholds:
      a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
      b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
   3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.17 SILENCERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives
   2. Acceptable Manufacturers: Burns, Trimco

B. Requirements:
1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.18 FINISHES

A. Finish: BHMA 626/652 (US26D); except:
   1. Hinges at Exterior Doors: BHMA 630 (US32D)
   2. Continuous Hinges: BHMA 630 (US32D)
   3. Continuous Hinges: BHMA 628 (US28)
   5. Protection Plates: BHMA 630 (US32D)
   6. Overhead Stops and Holders: BHMA 630 (US32D)
   7. Door Closers: Powder Coat to Match
   8. Wall Stops: BHMA 630 (US32D)
   9. Latch Protectors: BHMA 630 (US32D)
  10. Weatherstripping: Clear Anodized Aluminum
  11. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Where on-site modification of doors and frames is required:
   1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
   2. Field modify and prepare existing door and frame for new hardware being installed.
   3. When modifications are exposed to view, use concealed fasteners, when possible.
   4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:

SP 22-7 TULSA POLICE DEPARTMENT HELIPORT
BKL Project No. 811
APRIL 26, 2023
087100 - 18
a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

2. Custom Steel Doors and Frames: HMMA 831.

B. Install each hardware item in compliance with manufacturer’s instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

I. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying section.

J. Lead Protection: Lead wrap hardware penetrating lead-lined doors. Levers and roses to be lead lined. Apply kick and armor plates on lead-lined doors with adhesive as recommended by manufacturer.

K. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Testing and labeling wires with Architect's opening number.

L. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

M. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.

N. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

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 DEMONSTRATION

A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.8 DOOR HARDWARE SCHEDULE

A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Sets:

<table>
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<th>Hardware Group No. 001 For use on Door #(#s):</th>
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<th>132E</th>
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-COORDINATE HARDWARE WITH DOOR MFR.
-REMOVE CYLINDER AND CORE IF NOT REQUIRED.
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**For use on Door #103**

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*INDICATOR ON OUTSIDE OF DOOR.*
Hardware Group No. 403
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Hardware Group No. 403S
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Hardware Group No. 500
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106

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Hardware Group No. 501C
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Hardware Group No. 801
For use on Door #/s: 115 121

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For use on Door # (s):
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**BASIS OF DESIGN HARDWARE SET**

- CONFIRM TRACK CAN SUPPORT DOOR WEIGHT AND SIZE.
- CONFIRM ALL HARDWARE WITH THE DOOR MFR. PRIOR TO SUBMITTALS.
- PROVIDE STOP IN TRACK TO KEEP DOOR 4" INTO OPENING WHEN IN FULLY OPEN POSITION.
- ENSURE 32" OF CLEAR WIDTH IS MAINTAINED IN OPENING.

Hardware Group No. CE201
For use on Door # (s):
127

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Hardware Group No. CE205
For use on Door #(/s):
104 126 132A 132C 132D

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-INGRESS BY THE CARD READER OR KEY OVERRIDE.
-FREE EGRESS AT ALL TIMES BY INSIDE LEVER.

Hardware Group No. CE805A
For use on Door #(/s):
100A

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-INGRESS BY THE CARD READER OR KEY OVERRIDE.
Hardware Group No. G801F
For use on Door #(s):
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REFER TO SPECIFICATION 102215
BID ALTERNATE

END OF SECTION
SECTION 088000

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Glass for windows doors interior borrowed lites.
   2. Glazing sealants and accessories.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. 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.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
1.6 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
   1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.7 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
   1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Vitro Architectural Glass
   2. Other manufacturers submit for approval

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
   1. Design Wind Pressures: As indicated on Drawings.
   2. Design Snow Loads: As indicated on Drawings.
   3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
   4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
   1. 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.
   2. 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.
   3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

B. Safety Glazing Labeling: Where safety glazing 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.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IgCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.
2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

E. Silicone-Coated Spandrel Glass: ASTM C 1048, Type I, Condition C, Quality-Q3.

F. Reflective-Coated Spandrel Glass: ASTM C 1376, Kind CS.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
   2. Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING SEALANTS

A. General:
   1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
   2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
   3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

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:
2.8 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. 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.

3.3 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.

3.4 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.
B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.6 MONOLITHIC GLASS SCHEDULE

A. Glass Type 1: insulating glass.
   1. Overall Unit Thickness: 1 inch.
   2. Float glass.
   3. Vision glass made up of Vitro Solarban 60 on Solargray 6mm (2) over ½” air space over clear 6mm.

B. Glass Type 2: insulating glass.
   1. Overall Unit Thickness: 1 inch.
   2. Fully tempered float glass.
   3. Vision glass made up of Vitro Solarban 60 on Solargray 6mm (2) over ½” air space over clear 6mm.

END OF SECTION
SECTION 089119
FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fixed extruded-aluminum and formed-metal louvers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified
      models with appropriate AMCA Certified Ratings Seals.

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and
   attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

C. Samples: For each type of metal finish required.

D. Delegated Design Submittal: For louvers indicated to comply with structural and seismic
   performance requirements and design criteria, including analysis data signed and sealed by the
   qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on tests performed according to AMCA 500-L.

B. Sample warranties.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.5 WARRANTY

A. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to
   repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes
   within specified warranty period.
   1. Warranty Period: 10 years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.
   1. Wind Loads:
      a. Determine loads based on a uniform pressure of 30 lbf/sq. ft., acting inward or outward.

B. Seismic Performance:
   1. As indicated on Drawings.
   2. Louvers, including attachments to other construction, withstand the effects of earthquake motions determined according to ASCE/SEI 7.
      a. Component Importance Factor: 1.5.

C. Louver Performance Ratings: Provide loupers complying with requirements specified, as demonstrated by testing manufacturer’s stock units identical to those provided, except for length and width according to AMCA 500-L.

2.2 FIXED EXTRUDED-ALUMINUM LOUVERS

A. Horizontal Drainable-Blade Louver, Extruded Aluminum.
   1. Ruskin EME620DD.
   2. Louver Depth: 6 inches.
   4. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.3 LOUVER SCREENS

A. General: Provide screen at each exterior louver.
   1. Screen Location for Fixed Louvers: Interior face.
   2. Screening Type: Bird screening.

B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

C. Louver Screening for Aluminum Louvers:
   1. Bird Screening, Aluminum: 1/2-inch-square mesh, 0.063-inch wire.

2.4 MATERIALS

A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.

B. Fasteners: Use types and sizes to suit unit installation conditions.
2.5 FABRICATION

A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.6 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

D. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.2 ADJUSTING

A. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION
SECTION 092216
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of code-compliance certification for studs and tracks.

B. Evaluation reports for firestop tracks post-installed anchors and power-actuated fasteners.

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

A. 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.


B. Studs and Tracks: ASTM C 645.

1. Steel Studs and Tracks:

   a. Products: Subject to compliance with requirements, provide the following:

      1) ClarkDietrich.
      2) National Gypsum.
      3) Steel Network, Inc. (The).
b. Minimum Base-Metal Thickness: 25 Gauge and as required by performance requirements for horizontal deflection.
c. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated or as needed, provide one of the following:

1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 1-1/2-inch minimum vertical movement.
2. Single Long-Leg Track System: ASTM C 645 top track with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
3. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
4. Deflection Track: Steel sheet top track 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.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.0329 inch.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inches.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.0329 inch.
2. Depth: 7/8 inch.

G. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 3/4 inch.
2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

H. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.2 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
B. Hanger Attachments to Concrete:

1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.

2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges.

   1. Depth: 1-1/2 inches.

F. Furring Channels (Furring Members):

   1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
   2. Steel Studs and Tracks: ASTM C 645.
      b. Depth: As indicated on Drawings.
      a. Minimum Base-Metal Thickness: 0.0329 inch.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

   1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide[ one of] the following:

   2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.
PART 3 - EXECUTION

3.1 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 framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.2 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

   a. Install two 20 ga. studs at each jamb unless otherwise indicated.
   b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
   c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for
door openings unless otherwise indicated. Install framing below sills of openings to match
framing required above door heads.

4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or
powder-driven fasteners spaced 24 inches O.C.

F. Z-Shaped Furring Members:

1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in
place with Z-shaped furring members spaced [24 inches] O.C.
2. 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 O.C.
3. 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 from
corner and cut insulation to fit.

G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8
inch from the plane formed by faces of adjacent framing.

3.3 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than
spacings required by referenced installation standards for assembly types.

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. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION
SECTION 092900

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Interior gypsum board.
   2. Exterior gypsum board for ceilings and soffits.
   3. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Gypsum wallboard.
   2. Gypsum board, Type X.
   3. Mold-resistant gypsum board.
   4. Exterior gypsum soffit board.
   5. Interior trim.
   8. Laminating adhesive.
  10. Acoustical sealant.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and
   construction identical to those tested in assembly indicated according to ASTM E119 by an
   independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and
   that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers:
1. Manufactures: Subject to compliance with requirements, provide products by the following or an approved equal:
   a. Georgia-Pacific Gypsum LLC.
   c. USG Corporation.

2. Core: as indicated

3. Thickness: as indicated.


B. Gypsum Board, Type X: ASTM C1396/C1396M.

C. Gypsum Ceiling Board: ASTM C1396/C1396M.

D. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
   1. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C1396/C1396M, with manufacturer's standard edges.
   1. Core: As indicated.

2.5 TILE BACKING PANELS

A. Manufacturers:
   1. Manufactures: Subject to compliance with requirements, provide products by the following or an approved equal:
      a. Georgia-Pacific Gypsum LLC.
      c. USG Corporation.
   2. Core: as indicated

3. Thickness: as indicated.


B. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.
   1. Thickness: As indicated on Drawings.
   2. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

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.


1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
2. Shapes:
   a. Cornerbead.
   b. LC-Bead: J-shaped; exposed long flange receives joint compound.
   c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. When available, use mold resistant products designed for used with mold resistant gypsum board products.

C. Joint Tape:

1. Interior Gypsum Board: Paper.
3. Tile Backing Panels: As recommended by panel manufacturer.

D. 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.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

E. Joint Compound for Exterior Applications:

   1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.

F. Joint Compound for Tile Backing Panels:
1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. When available, use mold resistant products designed for used with mold resistant gypsum board products.

C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

D. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

   1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
   2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

E. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

   1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

F. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

   1. Basis-of-Design Product: Subject to compliance with requirements, provide United States Gypsum Company; SHEETROCK Acoustical Sealant; or a comparable product by one of the following:
      a. Pecora Corporation.

PART 3 - EXECUTION

3.1 INSTALLATION OF PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C840.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where
edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. 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.

3.2 FINISHING OF GYPSUM BOARD

A. Prefill open joints and damaged surface areas.

B. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

C. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
5. Level 5: Not Used.

D. Cementitious Backer Units: Finish according to manufacturer's written instructions.

E. Install control joints to provide following maximum unjointed lengths or areas:
   1. Partitions and soffits: 24 FT maximum straight run.
   2. Where practical; locate partition control joints aligned with door, cased opening, or window frame.
   3. Frames:
      a. Single door: Latch side of jamb from head of opening to top of partition.
      b. Pair of doors: Each side of jamb from head of opening to top of partition.
      c. Pair of doors, cross corridor: Not required.
      d. Cased opening: Each side of jamb from head of opening to top of partition.
      e. Window opening: Each side of jamb from head of opening to top of partition and from sill to floor.
   4. Ceilings: 50 FT with perimeter relief, maximum 30 FT without perimeter relief in one direction, and at change of direction or irregular shapes.
   5. Ceiling area: Maximum 2500 SF, with perimeter relief, maximum 900 SF, without perimeter relief.

F. Calk control joints behind base flush.
   1. Match base color.

G. Install suitable backing material to maintain required rating where control or expansion joints occur in fire or sound rated assemblies.

H. Install corner bead where partition or ceiling abuts structural element or dissimilar wall or ceiling.
3.3 PARTITION IDENTIFICATION

A. Identify partitions indicated on Drawings as having a required fire or smoke rating.
   1. Identification: Same as indicated on drawing legend.
   2. Location: 10 FT on center, both sides of partition, above ceiling line.
   3. Above access panels in hard ceiling.
   4. Lettering: 2 IN helvetica, painted with aid of stencils.
   5. Color: Red.

3.4 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction,
   and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION
SECTION 093013
CERAMIC TILING

PART 1 - GENERAL (Not Applicable)

1.1 SUMMARY

A. Section Includes:
   1. Porcelain tile.
   2. Waterproof membranes.
   3. Crack isolation membranes.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:
   1. Each type and composition of tile and for each color and finish required.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 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 1 full box minimum of each size, type, composition, color, pattern, and size indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Installer is with 10 plus years of experience installing ceramic tiled of similar project types and size.
PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

A. Porcelain Tile Type
   1. Reference Legend in the drawing set. Provide the product listed or an approved equal.
   2. Trim Units: Coordinated with sizes and coursing of adjoining tile and other materials.
      a. Reference drawings set for details.

2.3 TILE BACKING PANELS

A. Reference Gypsum Board specification 092900.

2.4 WATERPROOF MEMBRANES

A. General: Manufacturer's standard product[, selected from the following,] that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
   1. Products: Subject to compliance with requirements, provide one of the following or an approved equal:
      a. ARDEX Americas; Ardex 8+9.
      b. Bostik, Inc; Bostik GoldPlus.
      c. C-Cure; Red Waterproofing and Crack Prevention Membrane.
      d. Custom Building Products; REdGard Waterproofing and Crack Prevention Membrane.
      e. TEC; HydraFlex - Waterproofing Crack Insolation Membrane.
      f. LATICRETE; Laticrete Hydro Ban.
      g. MAPEI Corporation; Mapelastic™ AquaDefense.
      h. Merkrete; a Parex USA, Inc. brand; Hydro-Guard SP-1.
      i. NAC; SubSeal Liquid Waterproofing Membrane.
      j. Southern Grouts & Mortars, Inc; Southercrete 1132.
2.5 CRACK ISOLATION MEMBRANES

A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
   1. Products: Subject to compliance with requirements, provide one of the following or an approved equal:
      a. ARDEX Americas; Ardex 8+9.
      b. Bostik, Inc; Bostik GoldPlus.
      c. C-Cure; Red Waterproofing and Crack Prevention Membrane.
      d. Custom Building Products; REEdGard Waterproofing and Crack Prevention Membrane.
      e. TEC; HydraFlex - Waterproofing Crack Insolation Membrane.
      f. LATICRETE; Laticrete Hydro Ban.
      g. MAPEI Corporation; Mapelastic™ AquaDefense.
      h. Merkrete; a Parex USA, Inc. brand; Hydro-Guard SP-1.
      i. NAC; SubSeal Liquid Waterproofing Membrane.
      j. Southern Grouts & Mortars, Inc; Southercrete 1132.

2.6 SETTING MATERIALS

A. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Products: Subject to compliance with requirements, provide one of the following or an approved equal:
      a. ARDEX Americas; Ardex x7r
      b. Bostik: Reflex.
      c. C-Cure; Strata 914.
      d. TEC; TEC Super Flex TA 392 /393.
      e. LATICRETE SUPERCAP, LLC; 254 Platinum.
      f. MAPEI Corporation; Mapelastic.
   2. For wall applications, provide nonsagging mortar.

2.7 GROUT MATERIALS

A. High-Performance Tile Grout: ANSI A118.7.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. ARDEX Americas; Ardex FG-C Microtec.
      b. Bostik, Inc; True Color Rapid Cure.
      c. C-Cure; Perfect 930.
      d. TEC; TEC Power Grout TA 550.
      e. LATICRETE SUPERCAP, LLC; Spectralock Pro Premium Grout.
      f. MAPEI Corporation; Flexcolor CQ.

B. Grout for Pregrunted Tile Sheets: Same product used in factory to pregrunrt tile sheets.
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.

B. Self-Leveling Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Leveling clips: Use “RIDgid LevelMax Anti-Lippage Tile Leveling System” or equal.

D. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic designed specifically for wall and flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
   1. Manufacturers: Subject to compliance with requirements, provide the following or equal.
      a. Schluter Systems L.P.
   2. Satin Anodized Aluminum
   3. Reference drawings set for details

E. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

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 the performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

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

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowel-able leveling and patching compound specifically recommended by the tile-setting material manufacturer.
B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
   a. Tile floors in wet areas.
   b. Tile floors consisting of tiles 8 by 8 inches or larger.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

A. Leveling clips: Use "RIDGID Level Max Anti-Lippage Tile Leveling System" or equal. Provide additional spacers if mosaic sheet tile differs from mosaic sheet tile joint.

A. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

2. Glazed Wall Tile: 1/16 inch.

B. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
C. 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.

D. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer’s written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

E. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer’s written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer’s written instructions.

F. Install waterproof membrane to comply with ANSI A108.13 and manufacturer’s written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

G. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer’s written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

3.4 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Above Ground Concrete Subfloor:
      a. Ceramic Tile Type:
      b. Trowelable Underlayment (use self-leveling underlayment when needed)
      c. Waterproofing: Waterproofing material
      d. Crack Isolated: Crack Isolated material
      e. Thinset Mortar: Improved modified dry-set mortar.
      g. Sealed: Sealer

B. Interior Floor Installations, On Ground Concrete Subfloor:
   1. Ceramic Tile Installation: TCNA F113-16; thinset mortar.
      a. Ceramic Tile Type:
      b. Trowelable Underlayment (use self-leveling underlayment when needed)
      c. Waterproofing: Waterproofing material
      d. Crack Isolated: Crack Isolated material
      e. Thinset Mortar: Improved modified dry-set mortar.
      g. Sealed: Sealer

C. Interior Floor Installations with Self-Leveling Underlayment, Above Ground Concrete Subfloor:
      a. Ceramic Tile Type:
      b. Self-leveling underlayment
      c. Waterproofing: Waterproofing material
      d. Crack Isolated: Crack Isolated material
      e. Thinset Mortar: Improved modified dry-set mortar.
g. Sealed: Sealer

D. Interior Floor Installations with Self-Leveling Underlayment, Above, On Ground Concrete Subfloor:
      a. Ceramic Tile Type:
      b. Self-leveling underlayment
      c. Waterproofing: Waterproofing material
      d. Crack Isolated: Crack Isolated material
      e. Thinset Mortar: Improved modified dry-set mortar.
      g. Sealed: Sealer

E. Interior Wall Installations, Masonry or Concrete:
      a. Ceramic Tile Type:
      b. Waterproofing: Waterproofing material
      c. Crack Isolated: Crack Isolated material
      d. Thinset Mortar: Improved modified dry-set mortar.
      e. Grout: High-performance unsanded grout.
      f. Sealed: Sealer

F. Interior Wall Installations – Water Resistant Gypsum Board, Wood or Metal Studs or Furring:
   1. Ceramic Tile Installation: TCNA W243-16; thinset mortar on water resistant gypsum board.
      a. Ceramic Tile Type:
      b. Waterproofing: Waterproofing material
      c. Crack Isolated: Crack Isolated material
      d. Thinset Mortar: Improved modified dry-set mortar.
      e. Grout: High-performance unsanded grout.
      f. Sealed: Sealer

G. Interior Wall Installations – Cement Backer Board (Shower Location), Wood or Metal Studs or Furring:
   1. Ceramic Tile Installation: TCNA W244C-16; thinset mortar on Cement Backer Board.
      a. Ceramic Tile Type:
      b. Waterproofing: Waterproofing material
      c. Crack Isolated: Crack Isolated material
      d. Thinset Mortar: Improved modified dry-set mortar.
      e. Grout: High-performance unsanded grout.
      f. Sealed: Sealer

END OF SECTION
SECTION 095123
ACOUSTICAL CEILING TILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Acoustical tiles for interior ceilings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Class A according to ASTM E1264.
   2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL TILES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on the Drawings (FINISH LEGEND) or comparable product by one of the following:
   1. Armstrong World Industries, Inc.
   2. USG Corporation.
B. Thickness: 3/4 inch.
2.3 METAL SUSPENSION SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc; provide product indicated on the Drawings or a comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. USG Corporation.

B. Metal Suspension-System Standard: Manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M.

2.4 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table I, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

B. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical tiles in-place during a seismic event.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations complying with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for of suspension-system runners.

PART 3 - EXECUTION

3.1 PREPARATION

A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders unless otherwise indicated.

B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. Install suspended acoustical tile ceilings according to ASTM C636/C636M and manufacturer's written instructions.

B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

C. Arrange directionally patterned acoustical tiles as indicated on reflected ceiling plans.

END OF SECTION
SECTION 096513
RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
   
   A. Section Includes:
      
      1. Thermoset-rubber base.

1.2 ACTION SUBMITTALS
   
   A. Product Data: For each type of product.
   B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE <Insert drawing designation>

   A. Manufacturers: Subject to compliance with requirements, provide the following or an approved equal:
      
      1. Roppe Corporation; Roppe Holding Company.

   B. Product Standard: ASTM F1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
      1. Rubber Wall Base:
      2. Product Name: Pinnacles
         a. Type TS – rubber, vulcanized thermoset
         b. Group 1 – solid, (homogenous)
      4. Style B – Cove
      5. Material Height:
         a. 4"
         b. 6"
      6. Material Thickness: ASTM F386
         a. 1/8" (3.2 mm)
         b. Material Length: 120’ (36.58 m)
      7. Limited Warranty: 1 year, Manufacturing Only
     8. Material & Composition: 100% vulcanized homogenous rubber compound comprised of a premium blend & SBR rubber materials.
     9. Color: 640 Creekbed
    10. Surface Burning: ASTM E84/NFPA 255
a. Class B
   a. Class 1 (>0.45 Watts per sq. cm.), .082 W/cm2
12. Smoke Density:
   a. ASTM E662/NFPA 258
   b. Passes (<450), 157 (flaming) - 197 (non-flaming)
13. Surface Burning: CAN/ULC-S102.2
14. FSR 50, SDS 175
15. Substrate Preparation:
   a. Per ASTM F710 and Mfg Technical Data Sheet

C. Outside Corners: Job formed.

D. Inside Corners: Job formed.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or
   blended hydraulic-cement-based formulation provided or approved by resilient-product
   manufacturer for applications indicated.

B. Acrylic Adhesives:
   1. Acrylic Wall Base Adhesives: WB-600 - For standard, interior wall base installations over
      porous substrates only.
   2. Acrylic Wet-Set Adhesive: AW-510 - For interior wall base installations that require a more
      aggressive bond over porous substrates only.
   3. Water-Based Contact Adhesive: C-630 - For interior wall base installations that require a
      more aggressive bond over porous or non-porous substrates. Water-resistant type
      recommended by the resilient-product manufacturer for resilient products and substrate
      conditions indicated.

C. Cleaners
   1. All-Purpose pH Neutral Cleaner: NC-900 - For initial, daily or routine maintenance and spot
      cleaning.
   2. Performance Finish Remover: PR-930 - For removal of finish that has been accidentally or
      erroneously applied to the material.

PART 3 - EXECUTION

3.1 GENERAL

A. General Contractor Responsibilities:
   1. Supply a safe, climate controlled building and subfloor as detailed in Manufacture’s
      Technical Data Sheets.
   2. Ensure substrate meets the requirements of ASTM F710, Manufacture’s Technical Data
      Sheets and Excelsior Technical Data Sheets.
3. Ensure horizontal concrete substrates have been tested per ASTM F2170 and/or ASTM F1869 to confirm that concrete relative humidity and/or moisture vapor emission rates are within tolerance of the approved adhesive.

4. Confirm the porosity of all substrates to ensure proper adhesive usage.

5. Provide a secure storage area that is maintained permanently or temporarily at normal operating temperature and humidity conditions (except walk in freezers or similar) between 65° F and 85° F and between 40% and 65% relative humidity, for at least 48-hours prior to and during the application of the flooring, so the flooring contractor can acclimate the flooring materials per manufacturer’s instructions.

6. Provide an installation area that is weather tight and maintained either permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), normal operating temperature and humidity conditions (except walk in freezers or similar) between 65° F and 85° F and between 40% and 65% relative humidity, for at least 48-hours prior to and during the application of the flooring per the manufacturer’s instructions.

7. Ensure areas with direct prolonged exposure to sunlight are protected with protective UV-A/UV-B restrictive coatings or films.

8. Areas of the flooring that are subject to direct sunlight through doors or windows should have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72-hours after the installation to allow the adhesive to cure. Note: These areas should be installed using wet adhesives only.

9. Protect newly installed flooring with construction grade paper or protective boards, such as Masonite or Ram Board, to prevent flooring damage, especially by other trades. Limit usage and foot traffic according to the adhesive’s requirements. When moving appliances or heavy furniture, protect flooring from scuffing and tearing using temporary floor protection.

10. Ensure furniture casters are made of a soft material and have a contact point of at least 1” in width to limit indentation and flooring damage. All rolling chairs or seating must have a resilient flooring chair pad installed over the finished floor to protect floor covering. All fixed furniture legs must have permanent felt or soft rubber floor protectors installed on all contact points to reduce indentation. Floor protectors must have a flat contact point of at least 1” in width and must cover the entire bottom surface of the furniture leg.

11. Conduct initial maintenance prior to final usage per the Manufacturer’s Care & Maintenance Documents. Do not conduct initial maintenance until adhesive has cured per the adhesive technical data.

B. Flooring Contractor Responsibilities:

1. Provide trained installers that are professional, licensed, insured and acceptable to manufacturer of resilient flooring materials.

2. Ensure installers or installation teams meet one of the following requirements:
   a. Have completed INSTALL (International Standards & Training Alliance) or CFI (Certified Floorcovering Installers) training programs and/or are certified by INSTALL or CFI.
   b. Are being supervised by Project Managers or Field Supervisors that are INSTALL (International Standards & Training Alliance) certified, CFI (Certified Floorcovering Installers) Certified and/or an FCICA (The Flooring Contractors Association) CIM (Certified Installation Manager).

3. Follow all requirements in the appropriate Manufacturer’s Technical Data Sheets, Care & Maintenance Documents, Warranties and other technical documents or instructions.
3.2 EXAMINATION

A. General: Follow guidelines laid out in Division 01, Section 017100 – Examination and Preparation, as well as Section 014300 – Quality Assurance.

B. Verification of Conditions: Inspect all substrates to ensure they are clean, smooth, permanently dry, flat, and structurally sound.

3.3 SUBSTRATE PREPARATION

A. Ensure substrate meets the requirements of ASTM F710, Manufacturer’s Technical Data Sheets. Substrates must be free of visible water or moisture, dust, sealers, paint, sweeping compounds, curing compounds, residual adhesives and adhesive removers, concrete hardeners or densifiers, solvents, wax, oil, grease, asphalt, visible alkaline salts or excessive efflorescence, mold, mildew and any other extraneous coating, film, material or foreign matter.

B. Prepare substrates according to the manufacturer's written instructions to ensure the adhesion of resilient products.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.4 RESILIENT BASE INSTALLATION

A. Interface With Other Work: If caulking or sealing is required after installation, please contact the manufacturer for a suitable, matching caulk.

B. Comply with manufacturer's written instructions for installing resilient base.

C. 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.

D. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

E. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

F. Do not stretch resilient base during installation.

G. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

H. Job-Formed Corners:
1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than [3 inches] <Insert dimension> 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] <Insert dimension> in length.
   
a. Miter or cope corners to minimize open joints.

3.5 CLEANING AND PROTECTION

A. Clean up installation area and sweep, dust or wipe material to remove any dirt, dust or debris.

B. Conduct initial maintenance per the manufacturer’s Care & Maintenance documents

C. Protect newly installed material with construction grade paper or protective boards, such as Masonite or Ram Board, to protect material from damage by other trades. Limit usage and foot traffic according to the adhesive’s requirements. When moving appliances or heavy furniture, protect wall base from scuffing and tearing using temporary floor protection. Comply with manufacturer’s written instructions for cleaning and protecting resilient products.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION
SECTION 096519
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      1. Vinyl composition floor tile.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Samples: For each exposed product and for each color and pattern specified.

1.3 CLOSEOUT SUBMITTALS
   A. Maintenance data.

1.4 QUALITY ASSURANCE
   A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
   A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
      1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 VINYL COMPOSITION FLOOR TILE
   A. Manufacturers: Subject to compliance with requirements, provide what is listed in the drawings or an approved equal.
   C. Wearing Surface: Smooth.
D. Thickness: 5mm.

E. Size: 36 by 36 inches.

F. Colors and Patterns: Reference Finish Legend on A7 sheet series.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives
   1. Mohawk M95.0 Adhesive or an approved equal.
   2. Mohawk Total Bond Adhesive or an approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Material receiving, storage and handling
   1. Upon receipt of material, immediately remove any pallet wrapping materials and verify that the correct product and color was received and that the carton is free from damage. Be careful not to drop any cartons as this may damage the flooring. No labor claims will be honored on materials installed with visible defects.
   2. Store cartons of tile or plank products flat and squarely on top of one another. Select a storage location that is in the center of the installation area and away from vents, direct sunlight, etc. Check the carton label to verify that all materials are from the same run/lot number.

B. Job site conditions
   1. Flooring material and adhesive must be acclimated to the installation area for a minimum of 48 hours prior to installation. If the area is not within the recommended temperature and relative humidity requirements, the product should NOT be installed until those requirements have been met.
   2. It is recommended that resilient floor covering installation shall not begin until all other trades are completed.
   3. Areas to receive flooring shall be clean, fully enclosed, with the permanent HVAC set at a uniform temperature range of 65°F to 85°F and maintained following the installation. Never allow the area to drop below 55°F.
   4. Humidity should be below 65%.
   5. Areas to receive flooring should be adequately lighted during all phases of the installation process.
   6. Temperature – Radiant Heat
      a. Radiant heated substrates must never exceed 85°F surface temperature.
      b. Several days prior to installing resilient products over newly constructed radiant heated systems, make sure the radiant system has been on and operating at maximum temperature to reduce residual moisture within the concrete.
c. Three days prior to installation, lower the temperature to 65° F. 24 hours after installation gradually increase the temperature in increments of 5° F. After continuous operation of the radiant system, ensure the surface of the floor does not exceed 85°

C. Approved substrates and testing requirements
1. All substrates to receive moisture sensitive floor covering must be tested for moisture.
2. Do not install flooring if moisture test results exceed recommended limits.
3. Stop the job and advise the customer that installation cannot be initiated without the proper treatment for moisture conditions.
4. All substrates to receive resilient flooring shall be dry, clean, smooth, and structurally sound. They shall be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation or laitance, mold, mildew, and other foreign materials that might prevent adhesive bond.
5. Never use liquid adhesive remover or solvent cleaners for removing old adhesive residue or other substances on the substrate; their use could cause failure.
6. Type: Concrete Substrates
   1) Every concrete substrate on or below-grade must have an effective vapor retarder directly under the slab.
   2) Concrete floors shall be flat and smooth within the equivalent of 3/16” (3.9mm) in 10 feet and within the equivalent of 1/32” (0.8mm) in 12 in.
   3) F-Number System: Overall values of FF 36/FL 20 may be appropriate for resilient floor coverings.
   4) Smooth, glossy resilient flooring may require a higher value FF 75/FL 50 to prevent telegraphing issues.

b. Relative Humidity (RH)
   1) Tests must be performed per the latest edition of ASTM F 2170 - RH (Relative Humidity test). Three tests should be conducted for areas up to 1000 SF; and one additional test is required for each additional 1000 SF. RH limits are based on adhesive used. Refer to adhesive section.
      a) pH reading depends on adhesive used. Refer to adhesive section.
      b) Damp mop the surface with clear water to lower alkalinity.
      c) It is the floor covering installer’s responsibility to make sure these tests have been conducted and that the results are acceptable prior to installing the floor covering. When moisture tests are conducted, it indicates the conditions only at the time of the test.
      d) Use of cement-based patching and/or self-leveling compounds which contain Portland or high alumina cement and meet or exceed the compressive strength of 3000 psi are acceptable.

D. Concrete Substrates: Prepare according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.

4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
   a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
   b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

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.

3.2 FLOOR TILE INSTALLATION

A. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
   1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

B. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

C. Comply with manufacturer's written instructions for installing floor tile.
   1. Use the Manufacturers recommend adhesive following the directions on the adhesive label.
   2. Ensure that moisture and pH tests have been conducted and that the results do not exceed adhesive used.
   3. The permanent HVAC system is operational and set to a minimum of 65° F for a minimum of 72 hours prior to, during and after installation. After the installation, the maximum temperature should not exceed 85° F.
   4. Adhesive working and open times vary based on job conditions, substrate, temperature, and humidity.
   5. Install tiles running in same direction when arrows are on back of tile. Ensure that all recommendations for subfloor and jobsite conditions are met prior to beginning the installation.
   6. If more than one run/lot is to be used, the job should be laid out so that different run numbers are not installed side by side.
   7. Product can be loose laid and net fit in areas under 20'. Areas larger than 20' in any direction requires either perimeter glue or full spread and requires an 1/8" expansion gap.
   8. In areas of high foot traffic, more volatile temperature variations or excessive rolling loads, full spread adhesive is recommended.
   9. Once the installation is started, site conditions are accepted.

D. Installation:
1. 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.

2. Lay tiles square with room axis.
3. Apply adhesive with the recommended trowel (if applicable). Follow directions on adhesive label for open and working time. Do not exceed working time of adhesive, only spread adhesive that product can be installed within the working time of the adhesive.
4. Install all tiles with arrows pointing in the same direction making sure each piece is fitting tightly to the next.
5. If adhesive is used, roll once ASAP with a 75 or 100-pound, 3-section roller and roll again after 45 - 60 minutes in the opposite direction insuring the entire installation is rolled.

E. After Installation
1. Immediately remove any excess adhesive from the surface of the flooring using a clean white cloth dampened with a water. You may also use rubbing alcohol or denatured alcohol to remove tacky or dried adhesive. Dried adhesive may be removed with a clean white cloth dampened with mineral spirits.
2. Restrict to light traffic/foot traffic for a minimum at least a FULL 24 hours. Additional time may be necessary if the installation is over a non-porous substrate. Install the base moldings. Use silicone caulking to seal all areas that may be exposed to surface spills (i.e. tubs, toilets, and showers).
3. Restrict heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
4. Install appliances and furniture to the room by rolling or sliding them over strips of hardboard.
5. Allow at least five days following the installation before performing wet maintenance.

F. 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.

G. 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.

H. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

I. 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.

J. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

K. Preventative Care
1. Floor Traffic Glue Down Installations
a. Foot traffic is allowed 24 hours after installation when using M95.0 Resilient Flooring Adhesive. Restrict heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

b. Additional time may be necessary if the installation is over a non-porous substrate. In this condition, allow at least five days following the installation before conducting wet cleaning procedures or initial maintenance.

c. For glue down installations, wait 48 hours before wet cleaning and scrubbing new floors.

2. Floating Installations
   a. For floating installations, foot traffic may begin immediately after installation is complete.
   b. Use 1/4” or thicker plywood to protect the surface when moving heavy objects across the new floor.
   c. Use walk-off mats that are as wide as the doorway and long enough for soil load and weather conditions.
   d. Use mats with a non-staining backing.
   e. Floor protectors should be used on all furniture legs.
   f. The surface area of the floor protectors should be no less than 1” in diameter.
   g. Lightly damp mop the floor as needed.
   h. With floating installations, cleaning may begin immediately.

3. Initial Maintenance
   a. Sweep, dust mop or vacuum the floor thoroughly to remove all loose dust, dirt, grit and debris. Note: Vacuum beater bar must be disengaged.
   b. Remove any dried adhesive residue with a clean, white cloth dampened with mineral spirits, carefully following the use warnings on the container.
   c. Damp mop the floor with a pH-neutral cleaner.
   d. If necessary, scrub the floor using a rotary machine or auto scrubber with cleaner and the appropriate scrubbing brush (aggressiveness equivalent to a 3M red pad). Never use brown or black pads (too aggressive and can damage the product).
   e. Thoroughly rinse the entire floor with fresh, clean water. Remove rinse water and allow the floor to dry completely.
   f. Remove the cleaning solution with a wet-dry vacuum or auto scrubber until the floor is dry.
   g. Repeat the rinse process if necessary to remove any haze that may be visible.

END OF SECTION
SECTION 096723
RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Non-reinforced high build epoxy flooring system with final Polyester finish and Micro Guard protection.
   2. Resinous flooring.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Prior to the installation of the seamless system, meeting shall be held at the project site with
      the manufacturer’s representative, the installer, the Engineer/Architect, and the Owner’s representative. Record discussions and furnish a copy to each participant. Topics to be
discussed shall include, but not be limited to:
   a. Planned start and completion timing for each mobilization.
   b. Safety procedures.
   c. Coordination of other trades in area.
   d. Existing and new slab conditions.
   e. Slab testing results.
   f. Existing wall substrate conditions.
   g. Surface preparation.
   h. Required room temperatures.
   i. Ventilation.
   j. Step by step installation procedures.
   k. Curing time and methods.
   l. Protection of completed work.
   m. Review of performance requirements including chemical abuse, effluent
temperature, type, size, and weights of vehicular and static loads.

1.3 SUBMITTALS

A. Product Data: For each product indicated, include manufacturer’s technical data, application
instructions, and recommendations for each product component.

B. Shop Drawings:
   1. Provide floor plans to scale matching Architectural Plans, indicating extent of each resinous
floor/wall system, including type, color and pattern, degree of slip-resistance, and
dimensioned locations of control joints, seams, divider strips [if applicable], and
terminations.
   2. Provide enlarged details indication terminations at walls, door frames, pits, curbing, etc.

C. Samples: For each resinous system required, provide a sample applied to a rigid backing,
minimum size 3” x 3.”
D. Installer Certificates: Signed by manufacturer, certifying that installer complies with specified requirements.
   1. Letter of training certification from the manufacturer stating that the installer is approved to apply the products specified in this section.
   2. Written description of installer’s experience with specified material over the last 10 years, including job sizes and complexity. List a minimum of 5 projects including Owner’s names and phone numbers.

E. References: Installer shall submit a list of 5 projects of similar size and complexity as this project, including Owner’s names and contact phone numbers.

F. Warranty: Manufacturer shall provide a specimen copy of warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer/company who has a minimum of 10 years experience in applying the resinous flooring specified herein.

B. Source Limitations: Obtain all resinous flooring materials, including waterproofing membranes, grouts, resins, curing agents, grout coats, aggregates, topcoats, patching and fill material, joint sealants, and repair materials from a single manufacturer.

C. Manufacturer Supervision: An employee of the materials manufacturer must be present on site for the duration of the preparation and for all phases of the installation of the specified resinous flooring system. Manufacturer Field Services: The installer of the coating system shall contact the material manufacturer during the bidding phase of the project and shall include in the cost of his work, the cost of a manufacturer’s field engineering person to be present throughout the duration of all aspects of the work specified in this section as follows:

1. Material Manufacturer shall be responsible for the review of the project conditions that may impact product performance before product installation, including but not limited to project climate, acceptable temperature of substrate and air, acceptable humidity levels of air, acceptable moisture content of substrates to be coated, surface preparation, and all other conditions that are necessary for optimum product performance. The manufacturer’s field engineer shall document and verify that all conditions are acceptable prior to commencement of work.

2. The manufacturer’s field representative shall submit through the Contractor written approvals of the proposed coating system including manufacturer’s recommended applicator, manufacturer’s recommended application procedures, and manufacturer’s recommended surface preparation.

3. The manufacturer is solely liable for any warranty claims resulting from product failure, whether caused by defective product or improper installation for a period of 1 year. See warranty section: 1.09 for clarification.
4. The materials manufacturer's representative must be present on site for the pre-installation site conditions evaluation, for the duration of the surface preparation and for all phases of the installation of the specified resinous coating system. Installer's bid shall include the cost of the manufacturer's field services as specified above.

1.6 MOCKUP

A. When required apply mockups to verify selections made from sample materials and to set quality standards for materials and execution. The entity who approves the mockups and who performs the final inspection shall be the same.

1. Approved mockups may become part of completed Work if undisturbed at the time of Substantial Completion.
2. Apply full thickness mockups on a minimum of a 4' x 4' section of flooring integrated with a 4' x 4' section of wall selected by the Architect/Engineer.
3. If a cove base is to be included on the project, mockup shall include same.
4. Final floor finishes shall also reflect desired slip resistance if applicable. Note: Slip resistance textures can vary greatly but should follow these general guidelines.

   a. "A Texture": Provides a surface that can be cleaned by a standard mop without hanging up on the slip resistant medium. (occasional areas of mop hang-up are acceptable and normal but should not be the norm.)
   b. "B Texture": Provides a surface with enough surface texture that mop cleaning is difficult and a thorough cleaning will require a commercial grade floor scrubber.
   c. "C Texture": Provides a surface that is typically very rough to the touch and requires power-washing to adequately clean.

Note: The greater the texture the less cleanable a surface becomes.

1.7 DELIVERY, STORAGE, & HANDLING

A. Materials shall be delivered in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

B. Store materials in a location to prevent deleterious effects from sunlight, moisture, excessive heat, or cold.

C. Storage of materials shall comply with all fire and safety regulations.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application including the following:

   1. Maintain ambient air temperature between 65°F and 85°F.
   2. Concrete substrate shall be properly cured for a minimum of 30 days.

B. Conditions of Substrates:

   1. Floor slabs: Concrete must be sound and meet all requirements as outlined in Section 3.01 B.
C. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous floor/wall application.

D. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

E. Airborne contamination: flooring system shall not be applied in areas where dust or other airborne particulate matter is being generated.

1.9 Warranty

A. Manufacturer shall provide Owner’s agent with an appropriate form of warranty against defects in material and workmanship for a period of one year from date of substantial completion or date of beneficial occupancy, if earlier than date of substantial completion.
   1. Issuance of warranty to owner’s agent shall be a condition precedent to receipt of final payment to the Installer.
   2. Extent of warranty shall be limited to the repair or replacement of defective surfaces at no cost to the Owner, and for any damage directly resulting from such defects during the warranty period. The warranty shall not include any remedy for defects caused by abuse, improper maintenance or operation, or by normal wear, tear and usage.
   3. Single Source Warranty: The manufacturer must provide a single source warranty covering both labor and any product issues such as defects in the material, installation problems or inconsistencies such as slumping or sagging or other inconsistencies that do not meet the specification requirements or the standard set by the approved mock-up. The manufacturer is solely responsible for the proper installation of the specified system(s). Joint warranties between manufacturer and installer are not acceptable.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flammability: Self-extinguishing in accordance with ASTM D635.

2.2 MANUFACTURERS

A. Manufacturer of Basis of Design: Prime Coat Coating Systems, Gurnee, IL. Contact: Kurt Schilling; 217-971-3746; kschilling@primecoat.com.

2.3 systems

A. RES-1: Epoxy Polyester Chemical Resistant Flooring.
   2. System Characteristics:
      a. Color and Pattern: As selected by Owner from manufacturer’s full range.
      b. Wearing Surface: Smooth finish.
   3. System Components: Manufacturer’s standard components which are compatible with each other as follows:
      a. Moisture Mitigation System (as required when there is no effective vapor barrier under the slab.)
1) Product: As recommended by manufacturer to achieve a vapor retarder rating of 0.1 perm per ASTM F 3010.

b. Primer:
   1) PC 107
   2) Resin: 100% solids epoxy
   3) Application method: brush/roller and back-rolled.
   4) Installed thickness: 10-12 mils DFT
   5) Type: pigmented
   6) Number of coats: 1

c. Build Coat:
   1) Product: PC 401 Glazecoat
   2) Resin: 100% solids bisphenol A
   3) Application method: brush and roller
   4) Installed thickness: 10-12 mils DFT
   5) Type: pigmented
   6) Number of coats: 1

d. Top Coat:
   1) Product: PC 509 CRU Gloss
   2) Resin: polyester polyurethane
   3) Application method: brush/roll
   4) Installed thickness: 3.0-5.0 mils WFT
   5) Pathogen Protection: Resistant to spread of living pathogens meeting criteria in 2.02 A. 4. c. (see below)
   6) Skydrol protection: Product must be resistant to gasoline, jet fuels, and Skydrol.
   7) Type: Pigmented
   8) Number of coats: 1

e. Final Finish Coat:
   1) Product: PC 509 CRU Gloss
   2) Resin: polyester polyurethane
   3) Application method: brush/roll
   4) Installed thickness: 3.0-5.0 mils WFT
   5) Pathogen Protection: Resistant to spread of living pathogens meeting criteria in 2.02 A. 4. c. (see below)
   6) Type: clear
   7) Number of coats: 1

4. Performance Criteria:
   a. Resinous flooring shall withstand chemical attack by agents provided in writing by Owner, in temperatures and concentrations stated therein.
   b. Final Finish shall be proven to be fully resistant to rubber marks left from tires in constant contact with flooring material.
   c. Final finish shall Integrated anti-MRSA pathogen protection achieving a 99.9 reduction of micro-organisms as tested per JIS Z 2801 (Japanese Industrial Standard Committee) to assess performance of anti-microbial surfaces.
2.4 ACCESSORY MATERIALS

A. Patching and Fill Material: All non-moving joints and cracks shall be routed out and filled with PC 100 mixed with Cabosil to make a thixotropic patching compound.

B. Joint Sealants: All moving joints shall not be coated with specified coating system. After the specified coating system has been installed, fill moving joints with PC 610 Joint Coat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification: Verify that all substrate and environmental conditions are in compliance with requirements discussed during Pre-installation conference.

B. Mandatory Testing of Floor Slabs:
   1. Prior to the installation of flooring, it is mandatory that all surfaces are tested for moisture content, pH, and alkalinity levels that would be detrimental to the adhesion of coating materials. For tests to be accurate, temperatures and humidity levels should be stabilized for a minimum of 72 hours. NOTE: TESTING PERFORMED BY ANY METHOD IN UNCONDITIONED SPACES WILL NOT YIELD CONSISTENT RESULTS. Tests below must be completed in accordance with documented Test Methods:
      b. Other Testing procedures if required by manufacturer to insure substrate compatibility with products to be installed.
   2. Do not proceed with installation if moisture levels exceed 5% or 3 lbs. per 1,000 sf per 24 hours or if ambient temperature is less than 59°F above dew point unless approved by material manufacturer.

C. Testing Activities During Resinous Flooring Application
   1. Material Sampling: Owner’s representative may at any time and any number of times during resinous flooring application require the Owner’s independent testing agency to collect material samples for testing for compliance with requirements.
      a. When required by owner, material samples will be taken, identified, sealed, and certified in presence of Installer.
      b. When required by owner, testing agency will test samples for compliance with requirements, using applicable referenced testing procedures in addition to testing procedures listed in manufacturer’s product data.

3.2 PREPARATION

A. General: Prepare and clean substrates in accordance with manufacturer’s written instructions for substrate indicated. Provide clean, dry, and neutral pH substrate for resinous floor/wall application.

B. Concrete Floors General: Provide sound concrete surfaces free of laitance, glaze, effervescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Floor slabs shall be prepared as follows:
1. Cleaning/Degreasing: Use manufacturer’s recommended cleaner to remove surface contaminants such as grease, oils, and fluids. Rinse surfaces with clean water and allow to dry.
2. Mechanically abrade all surfaces to be coated to properly profile in accordance with ICRI CSP-2-3 to promote proper adhesion.
3. Remove and legally dispose of all debris and contaminants produced by the grinding.
4. All surfaces shall be clean, dry and free of surface contaminants prior to applying specified coating system.

3.3 INSTALLATION

A. General: Apply components of resinous flooring system according to manufacturer’s written instructions to produce a uniform, monolithic wearing surface at the specified thickness.
1. Coordinate application of components to provide optimum adhesion of resinous floor/wall system to substrate and intercoat adhesion.
2. At substrate control, isolation, and expansion joints, provide joint as necessary in resinous flooring in compliance with manufacturer’s directions and engineering details for each joint type.
   a. Apply backer rod and elastomeric joint compound into isolation or expansion joints in compliance with manufacturer’s directions.

B. Installation of RES-1
1. Apply one full coat of PC 107 Chem-Coat at 10-12 mils and allow to dry.
2. Apply one full coat of PC 401 at 10-12 mils and allow to dry.
3. Apply the finish coat of PC 509 pigmented at 3-5 mils WFT and allow to dry.
4. Apply final finish coat of PC 509 clear coat with PC 498 MRSA Guard at 3-5 mils WFT. Allow to fully cure a minimum of 72 hours prior to putting into full service. Note: Owner is responsible for choosing desired slip resistance according to definitions in section 1.06 D. If required slip resistant additive shall be added to final finish coat.

3.4 CURING

A. Cure resinous flooring components according to manufacturer’s written instructions. Prevent contamination during curing processes.
1. Temperatures shall be maintained at 70°F – 80°F if at all possible. Lower temperatures will increase the amount of time needed for resinous materials to reach full cure.
2. Water leaks must be prevented as they will compromise resinous flooring components ability to set properly. Premature liquid exposure to flooring finish that is not fully cured may compromise or stain finishes.
3. Steam or any airborne contamination will adversely affect curing.

3.5 CLEANING

A. Work area shall be left clean with all trash, equipment, and leftovers removed.

B. Floor may be cleaned prior to final inspection, provided complete curing has taken place. [Refer to Product Data Sheets for curing information for each product]. Generally, non-chlorinated detergents should be used for the first month after curing is complete.
3.6 PROTECTION

A. Protection from damage and wear during the construction process is recommended. Comply with manufacturer's recommendations for protective materials and their method of application. Where protection other than standard craft paper is required additional charges may be added to the original bid. Remove temporary protection prior to final inspection. Removal of this material is not the responsibility of the Installer.

END OF SECTION
SECTION 096813
TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modular carpet tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For carpet tile installation, plans showing the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.

2. Carpet tile type, color, and dye lot.

3. Type of subfloor.

4. Type of installation.

5. Pattern of installation.

6. Pattern type, location, and direction.

7. Pile direction.

8. Type, color, and location of insets and borders.

9. Type, color, and location of edge, transition, and other accessory strips.

10. Transition details to other flooring materials.

C. Samples: For each exposed product and for each color and texture required.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranty.
1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Certified by the International Certified Floorcovering Installers Association at the [Commercial II] [Master II] <Insert description> certification level.

1.6 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 10 years or length of the manufacturer warranty, whichever is longest, from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

A. Manufacturers: Subject to compliance with requirements, provide the specified product or equal by products by one of the following:

1. Patcraft.

2. Mohawk Group (The): Mohawk Carpet, LLC.


2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Self Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

C. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Concrete Slabs:

1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

   a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

   b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

   c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

2. Access Flooring Systems: Verify access floor substrate is compatible with carpet tile and adhesive, if any, and underlayment surface is gaps greater than [1/8 inch] <Insert dimension> and protrusions more than 1/32 inch.

3.2 PREPARATION

A. General: Comply with the Carpet and Rug Institute’s CRI 104 and with carpet tile manufacturer’s written installation instructions for preparing substrates indicated to receive carpet tile.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

D. Metal Substrates: Clean grease, oil, soil and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

A. General: Comply with the Carpet and Rug Institute’s CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer’s written installation instructions.
B. Installation Method: As recommended in writing by carpet tile manufacturer.

C. Maintain dye-lot integrity. Do not mix dye lots in same area.

D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install pattern parallel to walls and borders.

I. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION
SECTION 097713
STRETCHED-FABRIC WALL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY
   A. Section includes site-upholstered wall systems.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings: For each stretched-fabric system.
   C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS
   A. Coordination Drawings: Elevations and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved:
   B. Product certificates.
   C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS
   A. Maintenance data.

1.5 QUALITY ASSURANCE
   A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.6 WARRANTY
   A. Special Warranty: Manufacturer and Installer agree to repair or replace components of stretched-fabric systems that fail in performance, materials, or workmanship within specified warranty period.
      1. Warranty Period: Two years from date of Substantial Completion.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: Stretched-fabric wall systems are to comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency on systems prepared according to ASTM E2573. Identify products with appropriate markings of applicable testing agency.
   
a. Flame-Spread Index: 25 or less.
   
b. Smoke-Developed Index: 450 or less.

2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 286.

2.2 STRETCHED-FABRIC WALL SYSTEMS

A. Stretched-Fabric Wall System: Manufacturer's standard system consisting of facing material stretched tightly over a frame and core material and secured in the frame.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Whisper Walls or an approved equal:

2. Core: Manufacturer's standard Glass-fiber Board.
   
a. Core-Face Layer at community room: Manufacturer's standard impact-resistant, acoustically transparent, copolymer sheet.
   
b. Core-Face Layer at lobby reception desk: Manufacturer's standard tackable, impact-resistant, high-density board.

3. Frame Edge: Square profile.
   
a. Nominal Frame Thickness: ¼ inch or 1 inch.


2.3 MATERIALS

A. Core Materials:

1. Glass-Fiber Blanket: ASTM C553, ASTM C612, or ASTM C665; of type standard with manufacturer; nominal density of 3 to 4 lb/cu. ft.; flexible; with tackable, thermally
bonded white glass-fiber mat facing; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2. Tackable, Impact-Resistant, High-Density Board for Face Layer: 1/8-inch-thick layer of compressed molded glass-fiber board with a nominal density of 16 to 18 lb/cu. ft. laminated to face of core.

3. Impact-Resistant, Acoustically Transparent, Copolymer Sheet for Face Layer: 1/16- to 1/8-inch-thick layer of perforated, noncombustible, copolymer sheet laminated to face of core.

B. Frame Construction: Manufacturer's standard, continuous, extruded plastic frame (track).

C. Facing Material: Fabric from same dye lot; color and pattern as indicated on Drawings.

D. Lining Material: Fabric as selected by Architect from manufacturer's full range.

2.4 INSTALLATION MATERIALS

A. Installation Products: Concealed on back of system, recommended by stretched-fabric system manufacturer to support weight of system, fabric tension, and as follows:

1. Fasteners: Manufacturer's standard.

PART 3 - EXECUTION

3.1 PREPARATION

A. Measure each area and establish layout of panels and joints of sizes indicated on Drawings within a given area.

B. Before installation, allow fabric to adjust and become stable in spaces where it will be installed according to stretched-fabric system manufacturer's written instructions. Acclimatize fabric for minimum of 24 hours at ambient temperature and humidity conditions indicated for spaces when occupied for their intended use.

3.2 INSTALLATION

A. Install stretched-fabric systems according to system manufacturer's written instructions.

1. Provide continuous perimeter frames of each profile indicated, designed to be inconspicuous when covered by fabric facing, with smooth edges, and with surface finish that will not telegraph through fabric facing.

2. Install framing around penetrations.

3. Tightly fit framing to adjacent construction and securely attach to substrate.
4. Install core material with full coverage, flush with face of stretched-fabric system frame.

5. Attach frame and core to substrate with adhesive or fasteners or both to support system and prevent deformation of components.

6. Install stretched-fabric systems level and plumb unless otherwise indicated, true in plane, and with fabric square to the grain.

B. Fabric Installation: Apply fabric monolithically in continuous run over area, without joints or reveals, except where panel joints or midspan frames are indicated.

1. Fabric Seams:
   a. Sewn seams are not permitted.

2. Stretch and secure fabric to frame edges and so frame and frame attachment method are concealed by fabric unless otherwise indicated.


3.3 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
SECTION 099113
EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on exterior substrates.
   1. Steel and iron.
   2. Galvanized metal.

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI 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. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples: For each type of paint system and each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. 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.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. Colors: As selected by Architect from manufacturer's full range.

1. Ten percent of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMUs): 12 percent.
3. Wood: 15 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.
3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and 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.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

B. 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.

3.4 CLEANING AND PROTECTION

A. 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.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Ferrous Metals and Non-Ferrous Metals, HM Frames & Doors (except stainless steel):

   1. Polyurethane Industrial Coating System:


         1) Sherwin Williams Kem Kromik Universal Metal Primer, B50Z series.

      c. Topcoat: Industrial coating, exterior, satin (MPI Gloss Level 5).

         1) Sherwin Williams Corothane II Satin Polyurethane, B65-200 Series.

B. Galvanized Metal:

   1. Acrylic Light Industrial Coating System MPI EXT 5.3J:
a. Prime Coat: Primer, galvanized, water based, MPI #134.
   1) Sherwin Williams Pro-Cryl Industrial Universal Primer B66-310 Series.


c. Topcoat: Industrial coating, exterior, water based, satin (MPI Gloss Level 5)
   1) Sherwin Williams Corothane II Satin Polyurethane.

d. Color to be selected

END OF SECTION
SECTION 099123
INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on interior substrates.

1.2 DEFINITIONS

A. MPI Gloss Level 1:
   1. Exterior Ceiling and Soffits - Traditional Matte finish
   2. Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 2:
   1. Ceilings and Soffits - High side sheen flat – a velvet like finish
   2. Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 3:
   1. Walls - Traditional Egg-shell-like finish
   2. 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 4:
   1. Restrooms, basement rooms, and penthouse (must be scrubable) - Satin-like finish
   2. 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. MPI Gloss Level 5:
   1. Opaque Trim - Traditional Semi-gloss
   2. 35 to 70 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 6:
   1. Not Used - Traditional Gloss
   2. 70 to 85 units at 60 degrees, according to ASTM D 523.

G. MPI Gloss Level 7:
   1. Not Used - High Gloss
   2. More than 85 units at 60 degrees, according to ASTM D 523.
1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.
   1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
      a. Vertical and Horizontal Surfaces: Provide samples of at least 50 sq. ft.
      b. Other Items: Architect will designate items or areas required.
   2. Final approval of color selections will be based on mockups.
      a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   2. Benjamin Moore & Co.
   5. Pratt & Lambert.
   7. Sherwin-Williams Company (The).
   8. Valspar Corporation - Architectural (Pro).

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Painting Schedule for the paint category indicated.
2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Transition Coat: Paint manufacturer's recommended coating for use where a residual existing coating is incompatible with the paint system.

C. Material Compatibility:
   1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
   2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

D. Colors: As indicated in a color schedule.
   1. Ten to Twenty percent of surface area will be painted with deep tones.

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. Fiber-Cement Board: 12 percent.
   3. Masonry (Clay and CMUs): 12 percent.
   5. Gypsum Board: 12 percent.
   6. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

B. 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.

C. Prepare surfaces to be painted according to the Surface-Preparation Schedule and with manufacturer's written instructions for each substrate condition.

D. Apply a transition coat over incompatible existing coatings.

E. Metal Substrate: Stripe paint corners, crevices, bolts, welds, and sharp edges before applying full coat. Apply two coats to surfaces that are inaccessible after completion of the Work. Tint stripe coat different than the main coating and apply with brush.

F. Blending Painted Surfaces: When painting new substrates patched into existing surfaces or touching up missing or damaged finishes, apply coating system specified for the specific substrate. Apply final finish coat over entire surface from edge to edge and corner to corner.

3.4 CLEANING AND PROTECTION

A. 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.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 SURFACE-PREPARATION SCHEDULE

A. If a project requires a variety of paint removal and surface-preparation methods, a schedule is useful for identifying separate requirements for each condition. This schedule is an example only and parallels the degrees of surface degradation (DSD) classified by MPI; revise to suit Project. Retain option in "General" Paragraph below if location and extent of each method are indicated on Drawings.

B. General: Before painting, prepare surfaces for painting according to applicable requirements specified in this schedule.
1. Examine surfaces to evaluate each surface condition according to paragraphs below.
2. Where existing degree of soiling prevents examination, pre-clean surface and allow it to dry before making an evaluation.
3. Repair substrate defects according to "Substrate Repair" Article.

C. Surface Preparation for MPI DSD 0 Degree of Surface Degradation:

1. Surface Condition: Existing paint film in good condition and tightly adhered.
2. Paint Removal: Not required.
3. Preparation for Painting: Wash surface by detergent cleaning; use solvent cleaning where needed. Roughen or de-gloss cleaned surfaces to ensure paint adhesion according to paint manufacturer's written instructions.

D. Surface Preparation for MPI DSD 1 Degree of Surface Degradation:

1. Surface Condition: Paint film cracked or broken but adhered.
2. Paint Removal: Scrape by hand-tool cleaning methods to remove loose paint until only tightly adhered paint remains.
3. Preparation for Painting: Wash surface by detergent cleaning; use other cleaning methods for small areas of bare substrate if required. Roughen, de-gloss, and sand the cleaned surfaces to ensure paint adhesion and a smooth finish according to paint manufacturer's written instructions.

E. Surface Preparation for MPI DSD 2 Degree of Surface Degradation:

1. Surface Condition: Paint film loose, flaking, or peeling.
2. Paint Removal: Remove loose, flaking, or peeling paint film by hand-tool or chemical paint-removal methods.
3. Preparation for Painting: Wash surface by detergent cleaning; use solvent cleaning where needed. Use other cleaning methods for small areas of bare substrate if required. Sand surfaces to smooth remaining paint film edges. Prepare bare cleaned surface to be painted according to paint manufacturer's written instructions for substrate construction materials.

F. Surface Preparation for MPI DSD 3 Degree of Surface Degradation:

1. Surface Condition: Paint film severely deteriorated obscuring fine architectural detail work because of paint-layer buildup and surface indicated to have paint completely removed.
3. Preparation for Painting: Prepare bare cleaned surface according to paint manufacturer's written instructions for substrate construction materials.

G. Surface Preparation for MPI DSD 4 Degree of Surface Degradation:

1. Surface Condition: Missing material, small holes and openings, and deteriorated or corroded substrate.
2. Substrate Preparation: Repair, replace, and treat substrate according to "Substrate Repair" Article.
3. Preparation for Painting: Sand substrate surfaces to smooth remaining paint film edges and prepare according to paint manufacturer's written instructions for substrate construction materials. Remove rust.

H. Painting: Paint as required for MPI DSD 2 degree of surface degradation.

3.6 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

B. 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.

3.7 INTERIOR PAINTING SCHEDULE

A. Ferrous Metal (Doors, Frames, Handrails and Miscellaneous Metals):

1. Egg Shell High Performance Finish
   c. Topcoat: Sherwin Williams Pro Industrial Water Based Catalyzed Epoxy Semi-Gloss, B73-360 Series.

B. Non-Ferrous Metal (Doors, Frames, Handrails and Miscellaneous Metals):

1. Egg Shell High Performance Finish

C. Wood Substrates: Wood trim.

1. High-Performance Architectural Latex System MPI INT 6.3A:
   a. Prime Coat: Primer, latex, for interior wood, MPI #39.
      1) Sherwin Williams PrepRite ProBlock Latex Primer/Sealer B51 Series.
   c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), MPI #139.

D. Gypsum Board Substrates:
1. High-Performance Architectural Latex System MPI INT 9.2B:
   a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      1) Sherwin Williams ProMar 200 Zero VOC Interior Latex Primer "B28W2600".
   c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), MPI #139.
      1) Sherwin Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy Egg Shell K45 Series.

E. Gypsum Board Substrates – Ceilings and Soffits:

1. Latex over Latex Sealer System MPI INT 9.2A:
   a. Prime Coat: Primer sealer, latex, interior, MPI #50.
   c. Topcoat: Latex, interior (MPI Gloss Level 1), MPI #52.
      1) Sherwin Williams ProMar 200 Zero VOC Interior Latex Flat B30-2600 Series.

END OF SECTION
SECTION 101100
VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Visual display board

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For visual display units.
   1. Include plans, elevations, sections, details, and attachment to other work.
   2. Show locations of panel joints

C. Samples: For each type of visual display unit indicated.

D. Product Schedule: For visual display units.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 1 years from date of Substantial Completion or manufacture warranty whichever is longer.
   2. Warranty Period: Life of the building.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

2.2 VISUAL DISPLAY BOARD: 10.MKBD

A. Provide the following or an approved equal:

B. Manufacturer / Company: Claridge Products

C. Product Name: LCS Elite – Frameless Magnetic Whiteboard

D. Size: 5’ x 10’
   1. Quantity: (1)

E. Alternate Size: 4’ x 4’
   1. Quantity: (2)

F. Writing Surface: Whiteboard Porcelain- White

G. Mounting & Orientation: Invisimount – Landscape

2.3 ACCESSORIES

A. High power magnets
   1. Supplier: MIKEDE
   2. Item Shape: Round
   3. Material: Neodymium
   4. Min of (15)
   5. Part Number: 15P-S

B. Minimum (4) color dry erase markers
   1. (1 set) per board

C. Microfiber Eraser
   1. (1) per board

D. Magnetic Tray for Markers
   1. 1 foot long min.
   2. (1) per board
PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

B. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.

END OF SECTION
SECTION 101400

ARCHITECTURAL SIGNAGE - GRAPHIC WINDOW FILM
(ALTERNATE)

PART 1 - GENERAL

1.1 SUMMARY

   A. Section Includes:

      1. Digital Window Graphics
         a. Mural 1 - using city map image (shutterstock tbd)
         b. Mural 2 - flood ink artwork (color tbd) onto topically clear window film mural of city map
         c. Badge at Conference room door.

1.2 PREINSTALLATION MEETINGS

   A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

   A. Product Data: Manufacturer’s current technical literature on each product to be used, including:
      1. Manufacturer’s Data Sheets.
      2. Preparation instructions and recommendations.
      3. Storage and handling requirements and recommendations.
      4. Installation methods.

   B. Shop Drawings showing artwork layout:
      1. Include plans, elevations, sections, and mounting details.
      2. Indicate dimensions, required clearances, method of field assembly, components, and location
         and size of each panel.
      3. Detail fabrication and assembly.

   C. Samples:
      1. Mural 1
         1) Portion of Shutterstock image on specified Manufacturer’s sheets of the same type to
            be installed.
      2. Mural 2
         a. Manufacturer’s standard sheets of the same type to be installed, showing full range of
            available graphics and colors for each type of exposed finish.

   D. Art work
      1. Digital graphics of map

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1.4 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance contracts.
B. Operation and maintenance data.

1.6 QUALITY ASSURANCE

A. Qualifications:
   1. Installers:
      a. Entity that employs installers and supervisors who are trained and approved by manufacturer or Authorized representative who is trained and approved by manufacturer.
      b. A single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
   2. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Follow Manufacturer's instructions for storage and handling.
B. Store products in manufacturer's unopened packaging until ready for installation.
C. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 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 recommended limits.

1.9 WARRANTY

A. Warranty Period: one year or manufacturer and installer warranty, whichever is longer from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
2.2 MATERIALS

A. Digital Window Graphics E-2104ZC or an approved equal.

B. Reference substitution specifications. Substitution must be provided and approved during the bidding process.

2.3 PRODUCT DESCRIPTION:

A. 2 mil optically clear polyester with a scratch resistant (SR) topcoating that offers excellent clarity, dimensional stability, scratch resistance, and printability. Specifically designed to ensure good adhesion with UV curable inks. Coated with NPL ultra clear high performance permanent acrylic adhesive which exhibits excellent optical clarity, adhesive flow, and excellent adhesion on a broad range of surfaces. The thicker 4 mil liner is designed to absorb the heat created during printing to minimize buckling and wrinkling of the film.

B. TYPICAL APPLICATIONS:
   1. Architectural window decorations, glass & plastic displays, window graphics, labels and decals

C. PERFORMANCE
   1. Facestock: 2 mil optically clear scratch resistant topcoated polyester that offers excellent clarity and dimensional stability combined with good high temperature and humidity resistance. The optically clear polyester provides high resolution imaging with excellent adhesion to UV curable inks.
   2. Adhesive: NPL ultra clear permanent acrylic adhesive has excellent chemical, humidity, and temperature resistance. NPL has been specifically developed for clear film applications requiring excellent optical clarity, flow-out properties, and resistance to ooze. Wet apply recommended for window applications.
   3. Liner: 4 mil clear polyester liner designed to ensure adhesive smoothness and preserve the films optical clarity. The 4 mil thickness is designed to absorb the heat created during printing to minimize buckling.

D. GENERAL CHARACTERISTICS

E. Physical Properties
   1. Film 2 mil ± 10%
   2. Adhesive 1 mil ± 10%
   3. Liner 4 mil ± 10%

F. Peel Adhesion Test Method FTM 1
   1. Stainless Steel
      a. Initial 12.2 g/25mm @ 72°F, 50% RH
      b. 24 Hours 16.4 g/25mm @ 72°F, 50% RH
   2. Glass
a. Initial 13.8 g/25mm @ 72°F, 50% RH
b. 24 Hours 15.8 g/25mm @ 72°F, 50% RH

G. Shear Resistance, Test Method FTM 8
1. >650 Minutes

H. Dimensional Stability Test Method FTM 14
1. Excellent Inches

I. Chemical Resistance AATCC 8
1. 3.5 = Good
2. Grey Scale
   a. 1 = Poor
   b. 5 = Excellent

J. Minimum Application Temperature +40 degrees F

K. Service Temperature Range -40 degrees F to +275 degrees F

EXECUTION

2.4 EXAMINATION

A. Film Examination:
1. If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
2. Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.
3. Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
4. Commencement of installation constitutes acceptance of conditions.

B. PREPARATION
1. Check with the manufacturer for installation kits. Use Manufacturer's application solution and squeegees when available through manufacturer.
2. Prep windows per manufacturer requirements.

2.5 INSTALLATION

A. Install per manufacturers requirements.

2.6 CLEANING

A. Clean per manufacturers requirements.
2.7 PROTECTION

A. Provided protection during the remainder of the construction to prevent damage to the film.

END OF SECTION
SECTION 101416
PLAQUES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal plaques.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plaques.
   1. Include fabrication and installation details and attachments to other work.
   2. Show plaque mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each plaque at least half size.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: One years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ’s "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 METAL PLAQUES

A. Cast Plaque: Cast-metal plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   2. Plaque Thickness: 0.50 inch.
   3. Finishes:
      a. Integral Metal Finish: Mill finish raised surface with dark oxidized background.
      b. Integral Aluminum Finish: Satin Aluminum.
      c. Baked-Enamel or Powder-Coat Finish: Custom color to match Tulsa County logo and other logos indicated on drawing.
      d. Overcoat: Manufacturer's standard baked-on clear coating.
   4. Background Texture: Ripple.
   5. Integrally Cast Border Style: Raised flat band.
   7. Letter Style: Varies
      a. Raised finish: Satin
   8. Logo Style:
      a. Raised at 4 different levels
      b. Finish: custom color to match Tulsa County logo and other logos indicated on drawings.
   9. Size: 18 x 18 inches (Verify Size)
   10. Text and graphics: Final Provided by owner at submittals

2.3 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. For exterior exposure, furnish nonferrous-metal stainless-steel or hot-dip galvanized devices unless otherwise indicated.
   3. Exposed Metal-Fastener Components, General:
      a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
   4. Plaque Mounting Fasteners:
      a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque unless otherwise indicated.
      b. Through Fasteners: Exposed metal fasteners matching plaque finish, with type of head indicated, installed in predrilled holes.
B. Adhesive: As recommended by plaque manufacturer.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.4 FABRICATION

A. General: Provide manufacturer's standard plaques according to requirements indicated.
   1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   2. 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.
   3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
   4. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.
   5. 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.

B. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted plaques to suit plaque construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.
   1. Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish to match plaque-background color unless otherwise indicated.
   2. Stainless-Steel Brackets: Factory finish brackets to match plaque background finish unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION OF METAL PLAQUES

A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
   1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
   2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
   3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
   4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Mounting Methods:
   1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.
b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Through Fasteners: Drill holes in substrate using predrilled holes in plaque as template. Countersink holes in plaque if required. Place plaque in position and flush to surface. Install through fasteners and tighten.

3. Brackets: Remove loose debris from substrate surface and install bracket supports in position, so that plaque is correctly located and aligned.

4. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of plaque and of suitable quantity to support weight of plaque after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as plaque is applied and to prevent visibility of cured adhesive at plaque edges. Place plaque in position, and push to engage adhesive. Temporarily support plaque in position until adhesive fully sets.

C. Remove temporary protective coverings and strippable films as plaques are installed.

END OF SECTION
SECTION 101423.16
ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes room-identification signs that are directly attached to the building.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For room-identification signs.
   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year from date of Substantial Completion or the manufacturer warranty, whichever is longer.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 ROOM-IDENTIFICATION SIGNS

A. Room-Identification Sign <Insert drawing designation>: [Sign] [Sign system] with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Amex Signs
   a. Bruce Anderson
   b. bruce@amexsign.com
   c. 918-622-0651

2. Claude Neon Federal Signs
   a. Robert Dail
   b. bob@cnfsigns.com
   c. 918-587-7171

3. KI/ Takeform
   a. Rodney Guinn
   b. rodney.guinn@ki.com
   c. 918.814.9330

4. ASI Sign Systems, Inc.
   a. Will Mitchelson
   b. oklahoma@asisignage.com
   c. 913.871.5575

5. Laminated-Sheet Sign: Back painted photopolymer face sheet with raised graphics laminated to acrylic backing sheet to produce composite sheet.
   a. Composite-Sheet Thickness: As indicated on Drawings.
   d. Color(s): As selected by Architect from manufacturer's full range.

   a. Edge Condition: As indicated on Drawings.
   b. Corner Condition in Elevation: As indicated on Drawings.
7. Mounting:
   a. Exterior signs: Surface mounted to wall with concealed anchors.
   b. Interior signs: Surface mounted to wall with heavy duty two-face tape magnetic tape.

2.3 SIGN MATERIALS

A. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

B. Vinyl Film: UV-resistant vinyl film with pressure-sensitive, permanent adhesive; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.

2.1 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.

2. For exterior exposure, furnish stainless-steel or hot-dip galvanized devices unless otherwise indicated.

3. Exposed Metal-Fastener Components, General:
   a. Fabricated from same basic metal and finish of fastened sign unless otherwise indicated.

4. Sign Mounting Fasteners:
   a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly unless otherwise indicated.
   b. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, and installed in predrilled holes.

B. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

2.2 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

2. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
3. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.


PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

2. Install signs so they do not protrude or obstruct according to the accessibility standard.

3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. 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. 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. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
4. 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. Place sign in position, and push to engage tape adhesive.

END OF SECTION
SECTION 102215
FIXED GLASS PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fixed, framed glass panel partitions with swinging glass doors.

1.2 REFERENCE STANDARDS

B. American Architectural Manufacturers Association (AAMA): www.aama.org:
   1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum

C. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI): www.asce.org:
   1. ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structure

D. ASTM International (ASTM): www.astm.org:
   1. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
   3. ASTM C1048 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
   4. ASTM C1172 Standard Specification for Laminated Architectural Flat Glass
   5. ASTM E84 Test Method for Surface Burning Characteristics of Building Materials
   6. ASTM E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
   7. ASTM E413 Classification for Rating Sound Insulation
   8. ASTM E557 Guide for the Installation of Operable Partitions

E. Builders Hardware Manufacturers Association (BHMA): www.buildershardware.com:
   1. ANSI/BHMA A156 Series

F. California Department of Health Services (DHCS): www.dhcs.ca.gov:
   1. Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers

G. Code of Federal Regulations
   1. 16 CFR 1201 Safety Standard for Architectural Glazing Materials

H. International Code Council (ICC): www.iccsafe.org:
1. ICC A117.1 Accessible and Usable Buildings and Facilities (ANSI)

I. U.S. Architectural & Transportation Barriers Compliance Board: www.access-board.gov:

1. Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate installation of glass panel partitions with installation of floor, wall, and ceiling construction to comply with substrate tolerance requirements of partition manufacturer.
2. Coordinate installation of anchors and secondary structural members indicated on approved glass panel partition shop drawings and specified in other sections.

B. Preinstallation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

A. Product Data: For each glass panel partition and door component specified, including:

1. Glass panels.
2. Frame and sill tracks.
3. Door hardware and accessories.

B. Shop Drawings: For fixed glass panel partitions.

1. Include plans, elevations, sections, and details. Provide numbered panel installation sequence.
2. Show locations and requirements for tracks, bracing, blocking, and attachments to other work.

C. Samples for Verification: For each exposed component including hardware, for each color and finish selected, of size indicated below:

1. Glass: Units 12 inches square.
2. Exposed Frame, Track, and Sill Members: Not less than 6 inches long.
3. Hardware: One of each type of exposed door hardware items.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified installer.

B. Warranty: Sample of unexecuted manufacturer warranty.
1.6 QUALITY ASSURANCE

A. Installer Qualifications: Experienced Installer equipped and trained for installation of glass panel partitions required for this Project with record of successful completion of not less than five projects of similar scope.

B. Single Source Responsibility: Provide glass panel partitions and associated hardware by a single manufacturer through a single source.

1.7 WARRANTY

A. Special Manufacturer's Warranty: Standard form in which manufacturer agrees to repair or replace components of glass panel partitions that demonstrate deterioration or faulty operation due to defects in materials or workmanship under normal use within warranty period specified.

1. Warranty Period: One year date of Substantial Completion or manufacturers warranty, which ever is longer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Provide glass door assemblies manufactured by dormakaba USA, Inc.; (800) 523-8483; email: spee@servicedormakaba.com; website: www.dormakaba.us, or comparable products of other manufacturer approved by Architect in accordance with Instructions to Bidders and Division 01 General Requirements.

2.2 PERFORMANCE REQUIREMENTS

B. Acoustical Performance: Provide glass panel partition tested by qualified testing agency as follows:

1. Sound-Transmission Requirements: Tested for laboratory sound-transmission loss performance according to ASTM E90, determined by ASTM E413, and rated for not less than STC indicated.

2.3 GLASS PANEL PARTITIONS

A. Fixed Glass Panel Partitions: Framed glass panel partition with perimeter channel frames, butt-glazed dry joint and framed joints between panels, equipped with swinging doors where indicated.


1. Sound Transmission Class (STC), ASTM E 90 and Outdoor-Indoor Transmission Class (OITC), ASTM E 1332:

   a. Framed partition with 12.0 mm thick laminated glass: STC 32; OITC 30.
   b. Swinging door with 12.0 mm thick laminated glass: STC 31; OITC 27.
2. Partition Frames: Aluminum extrusion, 1-3/4 by 4-1/8 inch (44 by 105 mm).

2.4 GLASS PANELS AND DOORS

A. Glass Panels, General: Provide glass panels that comply with 16 CFR 1201, Category II requirements for safety glazing. Permanently mark glazing with certification label of the SGCC.

1. Glass and Door Panel Thickness: Thickness required for size of panel based upon manufacturer's written recommendations, but not less than 12 mm.

B. Laminated Fully Tempered Clear Float Glass: ASTM C1172; consisting of two plies of 6 mm. thick glass with interlayer of 0.060-inch-thick clear polybutyral; unit thickness 12.7 mm.

2.5 SWINGING DOORS

A. Accessibility Standard: Comply with applicable provisions in ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 requirements of authorities having jurisdiction.

B. Single Door: Glass panel matching partition panel material and thickness; 36 by 84 inches.

2.6 MATERIALS

A. Aluminum: ASTM B221, with strength and durability characteristics of not less than Alloy 6063-T5.

B. Stainless Steel: ASTM A666, Type 304.

2.7 FINISHES

A. Aluminum Finish:

1. Clear anodic finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

B. Stainless Steel Finishes: No. 4 directional satin finish.

2.8 DOOR HARDWARE AND FITTINGS

A. Door Hardware, General: All-glass door hardware units in types, sizes, quantities, and mounting locations recommended by manufacturer for glass door types, sizes, and operation. For exposed components, match metal and finish of exposed partition fittings unless otherwise noted.

C. Pulls and Handles: Back-to-back.

1. Design: Vertical bar, 1 3/8" diameter, 60 inch.

E. Concealed Floor Closers and Top Pivots: Center hung; BHMA A156.4, Grade 1. Provide housings, bottom insert, top walking beam pivots, mounting plates, and accessories.

2. Swing: Double acting.
4. Opening Force: Comply with interior door operating force of authorities having jurisdiction for accessibility requirements and egress doors.

F. Accessory Fittings: Floor stops.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine partition substrates to determine if work is within glass panel partition manufacturer's required tolerances and ready to receive work. Proceed with installation of partitions once conditions affecting installation and performance of partitions meet manufacturer's requirements.

3.2 PARTITION INSTALLATION

A. General: Comply with glass panel partition manufacturer's written installation instructions and approved shop drawings.

B. Install glass panel partitions after other finishing operations have been completed.

C. Set units level, plumb, and true to line, with uniform joints.

D. Fasten glass panel partition framing to building structure and supports as indicated on approved shop drawings, utilizing approved fasteners and spacing.

E. Set framing in continuous bed of sealant or in positive contact with preformed gasket where indicated.

F. Set, seal, and grout floor closer cases.

3.3 ADJUSTING

A. Adjust doors and hardware to produce smooth operation and tight, uniform fit.

B. Adjust door closers to required timing and force.

C. Adjust latches and locks for smooth operation.

D. Test and adjust hardware linked to access control system.

E. Replace damaged panels and accessories.
3.4 CLEANING

A. Clean glass panels in accordance with glass manufacturer’s written instructions. Do not use cleaning agents or methods not approved by glass manufacturer.

B. Clean exposed metal surfaces to factory new appearance.

END OF SECTION
SECTION 102600
WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Corner guards.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of wall and door protection showing locations and extent.
   1. Include plans, elevations, sections, and attachment details.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: one year from date of Substantial Completion or the manufacturer warranty which every is longer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.

   2. Smoke-Developed Index: 450 or less.
B. Regulatory Requirements: Comply with applicable provisions in ICC A117.1.

2.2 CORNER GUARDS

A. Surface-Mounted, Opaque-Plastic Corner Guards 10.CG: Fabricated as one piece from PVC-free plastic; with formed edges; fabricated with 90- or 135-degree turn to match wall condition.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Construction Specialties, Inc.
   b. Koroseal Interior Products, LLC.


3. Color and Texture: As selected by Architect from manufacturer's full range.

2.3 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.

B. Adhesive: As recommended by protection product manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

   1. Provide anchoring devices and suitable locations to withstand imposed loads.

   2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.

   3. Adjust end and top caps as required to ensure tight seams.

END OF SECTION
SECTION 102800
TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      1. washroom accessories.
      2. Custodial accessories.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS
   A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS
   A. Maintenance data.

1.5 WARRANTY
   A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
      1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
   A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 WASHROOM ACCESSORIES
   A. Robe Hook *10.RH*
      1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-6727 or comparable product by one of the following:
a. American Specialties, Inc.
b. Bradley Corporation.
c. GAMCO Specialty Accessories; a division of Bobrick.

2. Description: Single-prong unit.
3. Material and Finish: Stainless steel, No. 4 finish (satin)
4. Mount to the restroom side of women 224 and men 225.

B. Toilet Tissue (Roll) Dispenser with shelf: 10.TTD
1. Basis-of-Design Product; Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-2840 or comparable product by one of the following:
   a. American Specialties, Inc.
   b. Bradley Corporation.
   c. GAMCO Specialty Accessories; a division of Bobrick.

2. Description: Double-roll dispenser with shelf.
5. Capacity: Designed for up to 5 ⅛” diameter tissue rolls.
6. Material and Finish: Type 304 Stainless steel, with satin finish.

C. Combination Automatic Paper Towel (Roll) Dispenser/Waste Receptacle:10.CTDWR
1. Basis-of-Design Product; Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-3974 or comparable product by one of the following.

   a. American Specialties, Inc.
   b. Bradley Corporation.
   c. GAMCO Specialty Accessories; a division of Bobrick.

2. Description: Automatic motion sensing mechanism with user-adjustable delay and paper towel length; battery powered. Combination unit for dispensing preset length of roll paper towels, with removable waste receptacle.
7. Liner: LinerMate, vinyl waste-receptacle liner 3944-134.
8. Lockset: Tumbler type for towel dispenser compartment and waste receptacle.

A. Stainless Steel Shower Corner Shelf: 10.SDSH
1. Redblock RB3 Moly Stainless Steel Shower Corner Shelf

   a. 316 stainless steel with molybdenum for superior protection from corrosive cleaners and hard water.
   b. Slots to drain away water & keep your soap from slipping.
   c. 3/4” gap between shelf & wall means less soap scum buildup and easier cleaning.
   d. Installs into 1/8” grout lines.
   e. The rb3 shower corner shelf fits perfectly into 1/8” (3mm) grout lines in the corner of your tiled shower.
   f. If you don’t feel comfortable using an oscillating tool to remove grout at the install tab locations (like in the install video), you can also use a hand tool designed to remove grout. This tool is also very effective at removing small amounts of grout.
   g. If your shower wall tiles have 1/16” grout lines, you will need to make room for the two installation tabs by cutting 1/16” off the tile, just under each of the corner shelf install tab install locations. Be careful not to chip or crack the tile.
   h. Be sure to measure the grout line before attempting installation. Grout line widths often vary so the rb3 corner shelf may fit into a thinner grout line without cutting the lower tile (shelf thickness is 3mm, or about 1/64” less than 1/8”).

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i. Since the rh3 shower corner shelf rests within the grout lines on each opposing wall in the corner of your shower, this grout line must be level across both walls if you want your shelf to be level.

j. You should also keep in mind that the slotted shelf design, and the 3/4" gap behind the shelf allows water to drain off its surface, so there's no need to slant the shelf outward during installation.

B. Liquid-Soap Dispenser 10.SD:
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-2111 or comparable product by one of the following:
      a. American Specialties, Inc.
      b. Bradley Corporation.
      c. GAMCO Specialty Accessories; a division of Bobrick.
   2. **Description:** Designed for dispensing antibacterial soap in liquid or lotion form.
   3. **Mounting:** Vertically oriented, surface mounted.
   4. **Capacity:** 40 oz.
   5. **Materials:** Corrosion-resistant valve dispenses commercially marked all-purpose hand soaps. To prevent corrosion of the tank, use only chloride-free pH-neutral liquid soaps. Valve is operable with one hand with less than 5 pounds of force. Concealed, vandal-resistant mounting.
   6. **Lockset:** Tumbler type.
   7. **Refill Indicator:** Window type.

C. Mop and Broom Holder 10.MBH:
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-239 x 34 or comparable product by one of the following:
      a. American Specialties, Inc.
      b. Bradley Corporation.
      c. GAMCO Specialty Accessories; a division of Bobrick.
   2. **Description:** Surface mounted holder designed to keep mops and brooms away from wall. Length: 36 inches.
   3. **Mop/Broom Holders:** Four, spring-loaded, rubber hat, cam type.
   4. **Material and Finish:** Stainless steel, No. 4 finish (satin).

D. Mirror Unit 10.MU:
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-2908 or comparable product by one of the following:
      a. American Specialties, Inc.
      b. Bradley Corporation.
      c. GAMCO Specialty Accessories; a division of Bobrick.
   2. **Frame:** Stainless-steel angle, 0.05 inch thick.
      a. **Corners:** Mitered and mechanically interlocked.
   3. **Hangers:** Produce rigid, tamper- and theft-resistant installation, using method indicated below.
      a. **One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.**
   4. **Size:** 24IN X 36IN.

E. Grab Bar 10.GB36:
   1. **Basis-of-Design Product:** Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-6806x36 or comparable product by one of the following:
      a. American Specialties, Inc.
b. Bradley Corporation.
c. GAMCO Specialty Accessories: a division of Bobrick.

3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin).
5. Configuration and Length: 36 inch Horizontal.

F. Grab Bar 10.GB18V:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-6806x18 or comparable product by one of the following:
   a. American Specialties, Inc.
   b. Bradley Corporation.
   c. GAMCO Specialty Accessories: a division of Bobrick.
3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin).

G. Grab Bar 10.GB42:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-6806x42 or comparable product by one of the following:
   a. American Specialties, Inc.
   b. Bradley Corporation.
   c. GAMCO Specialty Accessories: a division of Bobrick.
3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin).
5. Configuration and Length: 42 inch Horizontal.

H. Grab Bar 10.GB48:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc B-6806x48 or comparable product by one of the following:
   a. American Specialties, Inc.
   b. Bradley Corporation.
   c. GAMCO Specialty Accessories: a division of Bobrick.
3. Material: Stainless steel, 0.05 inch thick.
   a. Finish: Smooth, No. 4 finish (satin).
5. Configuration and Length: 48 inch Horizontal.

I. Shower Curtain Rod 10.SCR:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc; B-6047 or a comparable product by one of the following:
a. American Specialties, Inc.
b. Bradley Corporation.
c. GAMCO Specialty Accessories; a division of Bobrick.

2. Description: 1-1/4-inch OD; fabricated from nominal 18 gauge stainless steel.
4. Finish: Stainless steel, No. 4 finish (satin).
5. Shower Curtain:
   a. Basis-of-Design Product: Subject to compliance with requirements, provide Bradley Corporation; BR-9537 or a comparable product by one of the following:
      1) American Specialties, Inc.
      2) Bobrick Washroom Equipment, Inc.
      3) GAMCO Specialty Accessories; a division of Bobrick.
   b. Size: Minimum 24 inches wider than opening.
   c. Material: Duck, minimum 8 oz., white, 100 percent cotton.
   e. Grommets: Corrosion resistant at minimum 6 inches o.c. through top hem.

6. Shower Curtain Hooks: BR-9540 Chrome-plated or stainless-steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.

2.3 FABRICATION

A. 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, when tested according to ASTM F 446.

END OF SECTION
SECTION 104413
FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      1. Fire-protection cabinets for portable fire extinguishers.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Shop Drawings: For fire-protection cabinets.
   C. Samples: For each type of exposed finish required.

1.3 CLOSEOUT SUBMITTALS
   A. Maintenance data.

1.4 COORDINATION
   A. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
   A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.2 FIRE-PROTECTION CABINET (FEC)
   A. Cabinet Type: Suitable for fire extinguisher.
      1. AmeraProducts, Inc.
      2. Larson’s Manufacturing Company
B. Cabinet Construction: Fire Rating to match wall construction.
   1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.

C. Cabinet Material: Stainless steel sheet.

D. Semi-recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
   1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

E. Cabinet Trim Material: Stainless steel sheet.

F. Door Material: Stainless steel sheet.

G. Door Style: Fully glazed panel with frame.

H. Door Glazing: Tempered float glass (clear).

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

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. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
   3. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
   4. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
      a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
         1) Location: Applied to cabinet glazing.
         2) Application Process: Pressure-sensitive vinyl letters.
         3) Lettering Color: Red.
         4) Orientation: Vertical.

K. Materials:
   1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304.
      a. Finish: ASTM A480/A480M No. 4 directional satin finish.
   2. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).
2.3 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.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

B. Install fire-protection cabinets in locations and at mounting heights indicated.

C. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

D. Identification: Apply vinyl lettering at locations indicated.

E. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

END OF SECTION
SECTION 104416
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes portable, hand-carried fire extinguishers.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS
A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS
A. Operation and maintenance data.

1.5 COORDINATION
A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers:
   1. JL Cosmic 20E Multi-Purpose ABC 20lbs. Fire Extinguisher or approved equal.
   2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.
   3. Provide one fire extinguisher at each Fire cabinet location (FEC)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine fire extinguishers for proper charging and tagging.
   1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION
SECTION 105100

LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

   A. Section Includes:

      1. Lockers

1.2 SUBMITTALS

   A. Product Data: Manufacturer’s data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.

   B. Shop Drawings: Drawings shall be submitted showing individual locker size and overall dimensions.

   C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

   D. Verification Samples: For each finish product specified, two samples, minimum size 3 inches square, representing actual product, color, and patterns.

1.3 CLOSEOUT SUBMITTALS

   A. Maintenance contracts.

   B. Operation and maintenance data.

1.4 QUALITY ASSURANCE

   A. Manufacturer Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.

   B. Installer Qualifications: A company regularly engaged in installation of products specified in this Section, with a minimum of 5 years experience.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.

B. Locker components shall be stored flat until assembly. All finishes shall be protected from soiling and damage during handling.

1.6 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 recommended limits.

1.7 WARRANTY

PRODUCT DATA SHEET 1 - Tufftec Warranty: Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

PRODUCT DATA SHEET 2 - Duralife Warranty: Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 15 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Scranton Products, which is located at: 801 E. Corey St.; Scranton, PA 18505; Toll Free Tel: 800-445-5148; Fax: 855-376-6161; Email:request info (info@scrantonproducts.com); Web:http://www.scrantonproducts.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 LOCKERS

A. Design: Solid plastic storage locker.
   1. Product: Duralife Locker.
   2. Vertical Stack: One Tier
   3. Passes NFPA 286.
   4. Recycled content. minimum 25 percent.

B. Size: Individual and stack height as indicated on drawings.
   1. Locker Depth: 18 inches (457 mm).
   2. Locker Width: 15 inches (381 mm).

C. Hardware:
   1. Metal Coat Hook: Top-mounted, two-pronged metal coat hook.
   2. Padlock hasp.
3. Horizontal venting.
4. Continuous hinge.
5. Base.
6. End panel.

D. Locker Bases: Supplied 4 inches (102 mm) high, black unless otherwise specified. Fabricated from 3/4 or 1 inch (19 or 25 mm) black plastic. Bases are assembled in the field.

2.3 CONSTRUCTION

A. Locker Doors and Frames: Made from high impact, high density polyethylene (HDPE) formed under high pressure into solid plastic components 1/2 inch (13 mm) thick with homogeneous color throughout.

B. Sides, Tops, Bottoms, Backs, and Shelves: Made from high impact, high density, polyethylene (HDPE) formed under pressure into solid plastic components 3/8 inch (9.5 mm) thick with homogenous natural color throughout. Vertical back, outside, inside panels, horizontal top, bottom, divider, and shelves will be grey in color.

C. End Panels: Filler panels of plastic material in color of locker unless noted otherwise as an accent color.

D. Continuous Latch: Made from high impact HDPE plastic and capable of accepting various locking mechanisms. The spring-loaded latch shall be securely fastened to the entire length of the door providing a quiet positive latching function.

E. Duralife Door Hinge: Heavy duty zinc-plated steel. Full length, assembled onto door and locker front.

F. Assembly Profile: To be full height of lockers. Profile to be tongue-and-groove joint construction using 3/8 inch thick HDPE.

G. Coat Hooks: Two-prong, high impact plastic. Mounted to bottom of shelf or divider. One each per door opening.

2.4 MATERIALS

A. Lockers to be constructed from High Density Polyethylene (HDPE) resins.
   1. Resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments.

B. HDPE Components: To have a smooth "orange peel" finish. Locker doors and door frames to be the same color.
   1. Duralife Color: As selected from manufacturer's standard colors.

2.5 FABRICATION

A. Locker Components: Fabricated square and rigid with a finish free of scratches and chips.

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B. Solid Plastic Locker Components: Snap together at profile connections or slide together at dovetail connections for easy assembly and provide a solid and secure anti-racking bookcase component construction for clean lines and precise reveals. Adjacent lockers share a common side panel. Locker units are manufactured for assembly in a group of no more than three adjacent lockers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Report discrepancies to the architect.

3.3 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. Install lockers at the location shown in accordance with the manufacturers’ instructions for plumb, level, rigid and flush installations.

C. Anchor the units to the wall studs through the locker back and to the floor using 1-1/2 inches (38 mm) tapcon screws.

D. Lockers shall be installed on a 4 inch (102 mm) high base as scheduled or indicated. Base shall be level for proper installation.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 105113

WELDED METAL LOCKERS

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

B. Personal Storage Lockers, Personal Storage Lockers with built-in bench drawers, Personal Storage Lockers with built-in external access drawers and Personal Storage Lockers in Multi-tier Configuration

C. (Note: all Personal Storage Lockers, Personal Storage with built-in bench drawers, and Personal Storage Lockers with built-in external access drawers must include environmental ventilation functionality as required)

D. Related Work, Not Furnished:
   1. Finish floor covering material and installation.

1.3 REFERENCES


B. American Society for Testing and Materials (ASTM) Standards:
   1. Applicable standards for steel sheet materials used for fabrication.
   2. Applicable standards for the testing of electrostatically applied Powder Coat Paint

C. American Institute Of Steel Construction (AISC) Standards:
   1. Applicable standards for steel materials used for fabrication.

1.4 DESCRIPTION

A. General: Welded Metal Lockers only with end-user reconfigurable interior. Specialized lances to provide the flexibility of on-site, end-user reconfiguration/addition of internal components anytime, anywhere, now or in the future.

B. Finishes:

C. Fabricated Metal Components and Assemblies: All components to be painted with an electrostatically applied Powder Coat paint that can meet or exceed test requirements set out by ASTM standard D3451-06 Standard Guide for Testing Coating Powders and Powder Coatings.
D. Sizes:
   1. Personal Storage Lockers with built-in bench and external access drawers: nominal heights of 84 inches; Drawer base nominal height is 18 inches and nominal depth is 24.

1.5 PERFORMANCE REQUIREMENTS

A. Design Requirements:
   1. Limit overall width not to exceed specified nominal width; locker width designed for zero growth.

B. Seismic Performance: Provide Welded Metal Lockers capable of withstanding the effects of earthquake movement when required by applicable building codes.

1.6 SUBMITTALS

A. Product Data: Submit manufacturer's product literature and installation instructions for each type of welded metal locker required. Include data substantiating that products to be furnished comply with requirements of the contract documents.

B. Shop Drawings: Show fabrication, assembly, and installation details, including descriptions of procedures and diagrams. Show complete locker installation layout, including quantities, locations and types of accessory units required. Include notations and descriptions of all installation items and components.
   1. Show installation details at non-standard conditions, if any.
   2. Provide layout, dimensions, and identification of each unit, corresponding to sequence of installation procedures.
   3. Provide installation schedule and procedures to ensure proper installation.

C. Samples: Provide minimum 3 inches example of each color and texture on actual substrate for each component to remain exposed after installation.

D. Selection Samples: For initial selection of colors and textures, submit manufacturer's color charts, consisting of actual product pieces, showing full range of colors and textures available.

E. Warranty: Submit draft copy of proposed warranty for review by the Architect.

F. Maintenance Data: Provide written documentation of the manufacturer’s statement, claiming the maintenance free nature of the product.

G. Reference List: Provide a list of recently installed welded metal lockers to be visited by owner, architect, and contractor. Intent of list is to aid in verifying the suitability of manufacturer's products and comparison with materials and product specified in this section. Include contact name, address, and phone numbers.

1.7 QUALITY ASSURANCE

B. Installer Qualifications: Engage an experienced installer who is the manufacturer's authorized representative for the specified products for installing welded metal lockers.
   1. Minimum Qualifications: 1-year experience installing welded metal lockers of comparable size and complexity to specified project requirements.

1.8 DELIVERY, STORAGE AND HANDLING

A. Follow manufacturer’s instructions and recommendations for delivery, storage and handling requirements.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify quantities of welded metal locker units before fabrication. Indicate verified measurements on shop drawings. Coordinate fabrication and delivery to ensure no delay in progress of the work.

B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating welded metal lockers units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 SEQUENCING AND SCHEDULING

A. Sequence welded metal lockers with other work to minimize possibility of damage and soiling, during remainder of construction period.

B. Schedule installation of specified welded metal lockers after finishing operations, including painting, have been completed.

C. Provide components, which must be built in at a time, which causes no delays in the general progress of the work.

1.11 WARRANTY

A. Provide a 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 Condition’s provisions of the Contract Documents.

B. Limited Lifetime Warranty: Subject to the conditions stated below, Spacesaver Corporation ("Spacesaver") warrants that the cabinets ("structural frames") manufactured by it will be free from defects in materials and workmanship for the lifetime of the structural frames. For the purposes of this warranty, structural frames shall be deemed to exclude all moving parts (doors, slides, hinges, and lock mechanism), removable accessories, vinyl coating, electronics and refrigeration equipment: Section Includes:

PART 2 - PRODUCTS
2.1 MANUFACTURERS

A. Spacesaver Corporation, or equal.
   1. Steve Story
   2. Southwest Solutions Group
   3. 14320 N. Lincoln Blvd. Unit 406
   4. Edmond, Oklahoma 73013
   5. 405-401-4445
   6. 1-800-803-1083
   7. sstory@southwestsolutions.com

2.2 BASIC MATERIALS

A. General: Provide materials and quality of workmanship, which meets or exceeds established industry standards for products specified. Use furniture grade sheet metal, solid hardwood benches and fasteners for component fabrication unless indicated otherwise. Material thicknesses/gauges are manufacturer’s option unless indicated otherwise.

B. LOCKER TYPES
   1. Personal Storage Lockers. Provide personal storage lockers with built-in external access drawers by Spacesaver Corporation.

2.3 MANUFACTURED COMPONENTS

A. Welded Frame:
   1. The welded frame must consist of top, bottom, back, and sides constructed of a minimum of 18-gauge steel. All frame components shall be joined using resistance welding. Riveting of structural members will not be permitted.
   2. Horizontal front flanges will be a minimum of 2 inches. Vertical front flanges will be a minimum of 1 inch. Horizontal and vertical flanges will overlap and be secured with a minimum two (2) resistance welds per corner.
   3. Corner gussets shall be MIG and spot welded in each of the four front corners of the locker for increased stiffness and rigidity.
   4. Provide side panel lances evenly spaced on 3 inch centers. Lances to provide the flexibility of on-site, end-user reconfiguration/addition of internal components anytime, anywhere, now or in the future.
   5. Bench Housing for built-in bench drawer
      a. Welded frame construction shall consist of top, bottom, and side components joined by using resistance welding. Riveting of bench housing structural members will not be permitted.
      b. Corner gussets shall be welded in the two (2) front bottom corners of the bench housing for increased stiffness and rigidity.
      c. Horizontal front flanges will be a minimum of 1 inch
      d. Vertical front flanges will be a minimum of 1 inch
      e. Horizontal and Vertical front flanges will overlap and shall be secured with minimum of one (1) resistance weld per corner.
      f. Side panels – Lances symmetric and evenly spaced to provide optimum component locations (standard based on 3 inch on center vertical placement to match mating locker lance design).
g. Return flanges on housing to securely fasten housing to welded frame of locker.
h. Base of bench housing shall include four (4) 3/8"-16 UNC threaded weld-nuts and corresponding leveling feet.
i. Top of bench housing shall include hole pattern for mating bench seat.
j. Sides of bench housing shall include mounting holes in the event lockers are ganged together.

6. Lockers with built-in bench drawer and built-in external access drawer shall have intermediate base shelf with interlocking mechanism for securing drawer when locker door is closed.
7. Base of lockers shall include four (4) 3/8"-16 UNC threaded weld-nuts and corresponding leveling feet.
8. Base shelf for lockers with built-in external access drawers and bench drawers shall have holes to accommodate double-door lock rod and door stop bracket. (only on 24 inch wide and larger)
9. End Panels: End Panels with no exposed fasteners shall be provided on the end of each locker run; thus providing a clean and aesthetically pleasing appearance.
10. All locker sizes and types to be specified by architect.
   a. Width:
      1) Personal Storage Locker with built-in bench drawer or external access drawer: 18 inches.
   b. Height:
      1) Personal Storage Locker with built-in bench drawer or external access drawer: 84 inches
   c. Depth:
      1) All lockers 24 inches
      2) Bench drawers: 36 inches
         a) Bench seat depth 13.0 inches
         b) Leading edge of bench seat to extend 1.125 inches from front of bench drawer
      3) External access drawer: 24 inches o

B. Ventilation:
   1. Provide louvered air vents in drawer front when built-in bench drawer or built-in external access drawer models are required.
   2. Minimum 0.500 inch gap between back of shelving components and back of locker to provide uninterrupted air flow up the rear of the locker system.
   3. Minimum 2.00 inch gap between front of shelving and locker door to provide uninterrupted air flow up the front of the locker system.

C. Drawers (for bench drawer and external access drawer):
   1. Drawer body wrapper shall be formed from single piece consisting of sides and bottom, with backs secured using structural locking lances.
   2. Drawers for locker with built-in bench drawers and built-in external access drawers shall have box-formed drawer front.
   3. Provide interlock system for securing drawer when main locker doors are closed and provide access only when main locker door/s is opened.
   4. Built-in bench drawer shall have a nominal 36 inche depth.
   5. Provide a flush mounted pull handle.
   6. Drawer Slides: Provide 200 lbs maximum load capacity and pass 50,000 cycle performance testing (Max. load, uniform distribution) (Test data to be provided by manufacturer upon request)
   7. Drawer base minimum 21 inches drawer extension
   8. Bench drawer minimum 26.5 inches millimeter drawer extension
9. Provide louvered air vents in drawer front when built-in bench drawer or built-in external access drawer models are required.

10. Provide capability of attaching glides for Body Armored Drying Rack, as requested.

D. Bench Seat:
1. Provide 13.0 inches deep laminated kiln dried maple bench seat; material thickness 1.25 inch.
2. Front (leading edge) of bench seat to square with eased edges.
3. Finish of bench seat shall be sanded smooth and have two (2) coats of catalyzed varnish applied.

E. Single-Piece Welded Doors (Single and Double Door Models):
1. Shall be formed from two (2) pieces of minimum 18-gauge cold rolled steel box formed and welded together using modern GMAW techniques. Single-piece door with inner and outer door panels shall have a combined steel thickness of no less than 0.096 inches thick. Welded door design with inner panel optimizes structural integrity of locker door system over and above any single frame door design.
2. Exterior door panel shall be constructed with formed flanges and return flanges to add stiffness.
3. Internal door panel shall be constructed with formed flanges for added stiffness.
4. All inner door panel (except Multi-Tier) heights shall be minimum 70% of external door height.
5. Multi-Tier inner door panels shall be full height.
6. Single-piece welded door frame shall consist of internal door panel nested inside exterior door panel and welded per the following requirements:
   a. Top / bottom. Exterior and interior panels to be welded in a minimum of three (3) places with weld spacing not to exceed 6 inches between adjacent welds and 1 inch from any corner.
   b. Sides. Exterior and interior panels to be welded with spacing not to exceed 12 inches between adjacent welds and 1 inch from any corner.
7. Inner door panel to have peg board style hole pattern, allowing the attachment of Document Holder and any standard peg board accessory.
8. Inner door panel to have 4 inch rectangular slot centered towards the top of the locker.
9. External door panel shall have louvers to provide adequate air circulation throughout locker system.
   a. Louvered air vents shall be approximately 3 inches in width and 0.75 inches in height and spaced on 1 inch centers.
10. Single door designs available in 18 inch
11. All doors shall have neoprene silencers on each door for noise reduction
12. Diamond Perforated Pattern:
   a. Single and Double door designs shall be available in diamond perforated pattern
   b. Pattern is defined as [0.875] by [0.875] inch or [22.2] by [22.2] millimeter diamond perforations on [1.768] inch or [44.9] millimeter centers
13. Door torsional deflection shall not exceed 0.1875 inch with a 20 lb point load. (Test data to be provided by manufacturer upon request)
14. Hinge:
   a. Provide 16-gauge full length hinge for increased strength and security of locker system.
   b. Hinges to be welded to door frame with spot welds not to exceed 6 inch separation.
15. Door assembly to be riveted to door frame on factory pre-established hole pattern.
16. Locking Mechanism:
   a. Padlock hasp only.

F. Interior/Accessory components (Architect/Owner to specify):
1. All interior components must be constructed of minimum 18-gauge or [1.214] millimeter steel (unless otherwise clarified in specification).
2. For added security, internal component can be secured utilizing blind rivets, threaded fasteners, or bending specially designed tab.
3. All interior components available at time of order and as post-installation upgrades in the future.
4. Shelves (available all locker models)
   a. Shelf with integral hanger bracket
      1) Size specified by locker width
      2) Hanger bracket designed with perforations on approximately 3 inch centers to insure clothing separation for optimum ventilation
      3) Performance: Uniform load rating 300 lbs
   b. Shelf rear return flange stops minimum 0.50 inch short of locker back panel on order to allow air circulation throughout entire locker assembly
   c. All performance test data shall be provided by manufacturer upon request.
5. Modular Shelf (available in all models except Multi-Tier)
   a. Provides storage compartment for smaller items
   c. Optional extended height of [24] inches or [609.6] millimeters available
   d. Modular shelves to have tabs to interlock with frame side panel lances
   e. Modular shelves vertical sides to have lances that match with opposing side panel lances.
   f. Modular shelves shall have two (2) locations on vertical side panel for attaching hooks, and one (1) location on bottom for attaching double hook accessories.
   g. Shelf rear return flange stops approximately [1] inch or [25.4] millimeters short of locker back panel on order to allow air circulation throughout modular shelf.
   h. Provide modular shelf with slots for connection with file dividers and shelf back stop. File dividers will aid in maintaining a neat and orderly locker system.
6. Provide lockable compartment for small
   a. Lockable compartment shall be integral to modular shelf accessory
   b. Provide a 14-gauge compartment door.
   c. Provide 0.188 inch diameter zinc plated steel hinge rod.
   d. Door to be mounted with zinc plated steel hinge rod and two shoulder washers for smooth, quiet operation.
   e. Provide an 18-gauge hasp bracket for securing lockable compartment door.
7. Adjustable Shelf
   a. Integral with modular shelf
   b. Shelf to have tabs to interlock with frame side panel and modular shelf lances.
   c. Shelf shall contain slots for file divider accessories as previously defined
8. Vinyl Mat (modular shelf) (available in all models except Multi-Tier)
   a. Material – Vinyl
   b. Color – Black
   c. Type – longitudinal round corrugated ribs
9. Document Holder (available in all models except Multi-Tier)
   a. Width –10.5 inches
   b. Height –6 inches
   c. Depth –1.5 inches
   d. Design to include matching hole pattern to allow various attachment locations on inner door panel
10. Boot Tray
    a. Material – Rubber
    b. Dimensions:
        1) Width –12.90 inches
2) Depth – 19.90 inches
3) Height – 1.25 inches
   c. Manufactured from Natural rubber compounds, environmentally friendly, durable, water repellant easily cleaned with soap and water, resistant to alkalis and weak acids, mold, mildew, and dust mites.

11. Body Armor Drying Rack
   a. Size of tray is controlled by locker width
   b. Bottom of drying tray shall have louvered pattern to provide air circulation throughout
   c. Shall have the ability to adjust/glide frontward and backward, while mounted in the bench drawer.

12. Internal Drawers
   a. Shall be available in all 18 inch wide locker models
   b. Drawer shall have a depth of approximately 19 inches
   c. Shall be available in 9 inch height, respectively.
   d. Drawer shall have locking option when specified by customer/architect
   e. Drawer shall have a tested weight capacity rating of 50 lbs
   f. WRTM Universal Base and Support Rail
   g. Shall be capable of using standard Spacesaver stock cups and barrel supports for weapons storage within the locker

13. Hooks
   a. Double Hook – shall have the ability to attach a double hook to the underside of the Modular Shelf
   b. Hook Bracket Hanger Assembly – shall have the ability to attach a three-hook bracket assembly to any lanced location on the side panels of the locker.

G. Locker Tag Numbers
   1. Shall provide locker numbers on each locker per customer requirement

H. ACCESSORIES:
   1. ZeeBase System: Provide manufacturer’s standard.
   2. Individual Welded Base: Provide manufacturer’s standard.
   3. (Optional) Trim and Fillers: Provide manufacturer’s standard.

I. FABRICATION
   1. General: Coordinate fabrication and delivery to ensure no delay in progress of the work.

J. FINISHES
   1. Colors: Selected from manufacturer’s standard available colors by Architect
   2. Paint Finish: Textured (Standard) – Provide factory applied electrostatic powder coat paint. Meet or exceed specifications of the American Society for Testing and Materials (ASTM) Standards:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Lockers scheduled to receive accessories with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of specified accessory items.
B. Proceed with accessory installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Follow manufacturer’s written instructions for installation of each type of accessory item specified.

3.3 FIELD QUALITY CONTROL

A. Verify accessory unit alignment and plumb after installation. Correct if required, following manufacturer’s instructions.

B. Remove components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new matching units, installed as specified and in manner to eliminate evidence of replacement.

3.4 ADJUSTING

A. Adjust all accessories to provide smoothly operating, visually acceptable installation.

3.5 CLEANING

A. Immediately upon completion of installation, clean components and surfaces. Remove surplus materials, rubbish and debris, resulting from installation, upon completion of work and leave areas of installation in neat, clean condition.

3.6 DEMONSTRATION/TRAINING

A. Schedule and conduct demonstration of installed accessory items and features with Owner's personnel.

B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end-user personnel would normally perform.

3.7 PROTECTION

A. Protect system against damage during remainder of construction period. Advise owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

END OF SECTION
SECTION 107516
GROUND-SET FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY
   A. Section includes ground-set flagpoles made from aluminum.

1.2 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

1.3 CLOSEOUT SUBMITTALS
   A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS
   A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.
      1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is noted on the drawings.

2.3 ALUMINUM FLAGPOLES
   A. Aluminum Flagpoles: Cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of .375 inch.
      1. Manufacturers: Subject to compliance with requirements, provide products by the following:
a. **Concord Industries, Inc.: EXTREME Internal Halyard**
b. Other manufacturers submit for approval.

B. Exposed Height: 70 feet.

C. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch wall thickness with 3/16-inch steel bottom plate and support plate; 3/4-inch-diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

D. Sleeve for Aluminum Flagpole: foundation sleeve recommended by manufacturer, made to fit flagpole, for casting into concrete foundation.

### 2.4 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

   1. 0.063-inch spun aluminum with gold anodic finish.

B. Internal Halyard, Winch System: Concord Stationary mount platform 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. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

### 2.5 MISCELLANEOUS MATERIALS

A. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

B. Sand: ASTM C 33/C 33M, fine aggregate.

C. Elastomeric Joint Sealant: Multicomponent nonsag urethane joint sealant complying with requirements in Section 079200 "Joint Sealants."

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

### 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 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.
B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

D. Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.

E. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete". Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

F. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpole where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, 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 layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION
SECTION 122413
ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manually operated roller shades with single rollers.
   2. Manually operated roller shades for skylights.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

PART 2 - PRODUCTS

2.1 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Draper Inc or comparable product by one of the following:

2. Lutron Electronics Co., Inc.

3. MechoShade Systems, Inc.

4. Springs Window Fashions; SWFcontract.

B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Nickel-plated metal or Stainless steel.
   a. Loop Length: Full length of roller shade.
   b. Limit Stops: Provide upper and lower ball stops.
   c. Chain-Retainer Type: Chain tensioner, sill mounted.

2. Spring Lift-Assist Mechanisms: Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: Right side of interior face of shade As indicated on Drawings.

2. Direction of Shadeband Roll:
   a. Exterior Windows: Regular, from back (exterior face) of roller
   b. Code Enforcement Lobby Window at Headquarters Building: [Reverse, from front (interior face) of roller].

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

E. 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.

F. Shadebands:


2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
   a. Type: Enclosed in sealed pocket of shadeband material.
   b. Color and Finish: Chosen from manufacturer standard line.

G. Installation Accessories:

1. Building Windows (Inside Mounted close to window)
   a. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
   b. Shape: L-shaped.
c. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open, but not less than 3 inches.

2. Code Enforcement Window at Headquarters (Wall mounted just above window with overlapping sides)

3. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.

4. Endcap Covers: To cover exposed endcaps.

2.2 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
   1. Source: Roller shade manufacturer.
   2. Type: Woven polyester and PVC-coated polyester.
   5. Weight: 15.1 – 16.2 oz./sq. yd.
   7. Orientation on Shadeband: Up the bolt.
   8. Openness Factor: 3 or 5 percent.

2.3 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
   2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
   1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
PART 3 - EXECUTION

3.1 ROLLER SHADE INSTALLATION

   A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

   B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

   C. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

   D. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION
SECTION 123661.19
QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Quartz agglomerate countertops.
   2. Quartz agglomerate backsplashes.
   3. Quartz agglomerate end splashes.
   4. Quartz agglomerate apron fronts.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 QUARTZ AGGLOMERATE COUNTERTOP MATERIALS

A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with ISFA 3-01.

   1. Manufacturers: Subject to compliance with requirements, provide products by the following or an approved equal:
      a. DuPont Corian

   2. Colors and Patterns: Reference Finish Legend on Drawings.

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.
2.2 FABRICATION

A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and the AWI/AWMAC/WTi's "Architectural Woodwork Standards."

1. Grade: Premium.

B. Configuration:

1. Front: Straight, slightly eased at top Straight, slightly eased at top with separate apron, 6 inches high, recessed 1/4-inch (6.4-mm) behind front edge.

2. Backsplash: Straight, slightly eased at corner.


C. Countertops: 3/4-inch- (19-mm-) thick, quartz agglomerate with front edge built up with same material.

D. Backsplashes: 3/4-inch- (19-mm-) thick, quartz agglomerate.

E. Joints:

1. Fabricate countertops without joints when possible.

2. Fabricate countertops in sections for joining in field, with joints at locations indicated.

F. Cutouts and Holes:

1. Undercounter Plumbing Fixtures: Make cutouts for fixtures using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by quartz agglomerate manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer.

B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
C. Secure countertops to subtops with adhesive according to quartz agglomerate manufacturer's written instructions.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive.

F. Install aprons to backing and countertops with adhesive.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION123661.19
SECTION 124813

ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roll-up rail mats.
   2. Recessed frames.

1.2 References

A. American Society for Testing and Materials (ASTM)
B. The Aluminum Association
C. The Carpet and Rug Institute (CRI)
D. The National Floor Safety Institute (NFSI)
E. International Organization for Standardization (ISO)

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings:
   1. Items penetrating floor mats and frames, including door control devices.
   2. Divisions between mat sections.
   3. Perimeter floor moldings and frames.
C. Samples: For each exposed product and for each color and texture specified.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.
1.5 Quality Assurance

A. Flammability in accordance with ASTM E648, Class 1, Critical Radiant Flux, minimum 0.45 watts/m².

[Specifier note: Slip and fall accidents are a major concern in commercial entranceways. We recommend that approved systems be certified by the manufacturer as meeting a minimum coefficient of friction, when tested in wet conditions, of 0.60.]

B. Slip resistance in accordance with ASTM D-2047-96, Coefficient of Friction, minimum 0.60 for accessible routes.

C. Standard rolling load performance to be 750 lb./wheel (load applied to a solid 5" x 2" wide polyurethane wheel, 1000 passes without damage).

D. Single Source Responsibility: Obtain floor mats/grids and frames from one source of a single manufacturer.

E. Utilize superior structural aluminum alloy 6105-T5 for rail components.

F. Utilize a manufacturer that is ISO 9001 & 14001 certified.

1.6 Delivery, Storage and Handling

A. Deliver materials to the project site ready for use and fabricated in as large sections and assemblies as practical, in unopened original factory packaging clearly labeled to identify manufacturer.

1.7 Project Conditions

A. Field measurements: Check actual openings for mats/grids by accurate field measurements before fabrication. Record actual measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

B. Recessed Conditions: IMPORTANT: Coordination with Division 03 00 00 Concrete specifications is required. For proper installation, the concrete recess must be flat and smooth throughout. If the recess is formed by a concrete contractor, the pour dimensions may require leveling grout to achieve the proper depth and a smooth finish. The final recess depth will match the specified product and must be field verified. For proper frame installation, the side walls of the concrete recess must also be straight and smooth. Inconsistencies with the recess and side walls must be remediated prior to product installation.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

A. Accessibility Standard: Comply with applicable provisions in ICC A117.1.
2.2 ROLL-UP RAIL MATS

A. Basis-of-Design Product: Subject to compliance with requirements, provide C/S Group or an approved equal.

B. Product:
   1. Reference Finish Schedule
   2. Representative:
      a. Peerless Building Resources LLC
      b. Greg Shelton
      c. 13645 Beta Road
      d. Dallas, Texas 75244 United States
      e. Phone: (214) 340-6400 - Fax: (214) 340-6424
      f. Email: gshelton@peerlessmarketing.com

2.3 FRAMES

A. Recessed Frames: Manufacturer's standard extrusion.
   1. Extruded Aluminum: ASTM B221.

2.4 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
   1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Manufacturer shall offer assistance and guidance to provide a template of irregular shaped mat/grid assemblies to ensure a proper installation.
3.3 INSTALLATION

A. Install recessed mat frames and mats to comply with manufacturer's written instructions so that tops of mats will be flush with adjoining finished flooring. Set mats with tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.

B. Install surface-type units to comply with manufacturer's written instructions; coordinate with entrance locations and traffic patterns.

C. Install the work of this section in strict accordance with the manufacturer's recommendations.

D. Set mat/grid at height recommended by manufacturer for most effective cleaning action.

E. Coordinate top of mat/grid surfaces with bottom of doors that swing across to provide ample clearance between door and mat/grid.

3.4 CLEANING

A. It is important to the life cycle of the entrance mat that a maintenance schedule be developed which includes regular vacuuming and extraction that correctly matches the amount of traffic the mat incurs.

3.5 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

B. Defer installation of floor mats/Grids until time of substantial completion of project.

END OF SECTION
SECTION 133419
METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Structural-steel framing.
   2. Metal roof panels.
   3. Metal wall panels.
   4. Metal soffit panels.
   5. Thermal insulation.
   6. Accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of metal building system component.

B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and attachments to other work.

C. Samples: For units with factory-applied finishes.

D. Design Calculations

E. Delegated-Design Submittal: For metal building systems.
   1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
   1. Name and location of Project.
   2. Order number.
   3. Name of manufacturer.
   4. Name of Contractor.
   5. Building dimensions including width, length, height, and roof slope.
   6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).

9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.


11. Foundation Reactions

C. Material test reports.

D. Source quality-control reports.

E. Field quality-control reports.

F. Sample warranties.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.
   1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
   2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Welding Qualifications: Qualify procedures and personnel according to the following:
   1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.5 WARRANTY

A. Provide building manufacturer's warranty guaranteeing the building system against defects in materials for one year from the date of acceptance and provide for replacement material as required within that time period.

B. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, registered in the State of Oklahoma to design metal building system.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA’s "Metal Building Systems Manual."

1. The structural steel building frame is an engineered system designed, manufactured and erected by the metal building contractor. The drawings, details and dimensions shown on these documents are representative of the Field Engineer’s requirements for the appearance of the final product. The foundation drawings are indicative of the expected loadings transmitted by this system. The metal building manufacturer is allowed to adjust the sizes and shapes in order to design the most efficient system for their product within these guidelines. Changes must be approved by the Field Engineer in writing. No additional compensation will be allowed for changes. The foundations are designed for pinned bases.


   a. Wind Loads shall be in accordance with ASCE 7-10, Exposure C, Risk Category IV and a wind velocity of 120 MPH.

   b. Live Load shall be 20 PSF minimum with tributary reduction not allowed as applicable per code.

   c. Dead Load shall be the weight of the metal building materials.

   d. Auxiliary Design Loads shall be 5 PSF to cover the dead load imposed by fire protection systems, ceilings and lighting, plus the actual weight of equipment or mechanical units located on or attached to the building. Refer to drawings for location of equipment and mechanical units including but not limited to crane supported by Pre-engineered metal building and ceiling fans. Contract Documents must be reviewed by the pre-engineered building engineer to identify any loads that may exceed the 5 PSF limit. Incorporate the necessary structure to carry these loads.

3. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."

C. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

E. Fire-Resistance Ratings: Where assemblies are indicated to have a fire-resistance rating, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E119 or ASTM E108 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

F. 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 positive pressure according to NFPA 252 or UL 10C.
   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.

G. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
   1. Wind Loads: As indicated on Drawings.

H. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E1680 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..

I. Air Infiltration for Metal Wall Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..

J. Water Penetration for Metal Roof Panels: No water penetration when tested according to or ASTM E331 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..

K. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E331 at the following test-pressure difference:
   1. Test-Pressure Difference: 6.24 lbf/sq. ft..

L. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
   1. Uplift Rating: UL 90.

M. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class I or noncombustible construction, as applicable. Identify materials with FM Global markings.
   1. Fire/Windstorm Classification: Class 1A- 90.
   2. Hail Resistance: SH.
N. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C1363 or ASTM C518:
   1. Roof:
      a. R-Value: R-29
   2. Walls:
      a. R-Value: R-13

2.2 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters and rake beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
      a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2.3 METAL ROOF PANELS

A. Mechanically seamed trapezoidal standing seam system: Formed with interlocking ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs.
   1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
      
      b. Color: As selected by Architect from manufacturer's full range.
   2. Clips: Two-piece floating to accommodate thermal movement.
   3. Joint Type: Mechanically seamed.
   5. Panel Height: 3 inches.
   6. McElroy Metal MasterLok-FS or approved equal.
2.4 EXTERIOR METAL WALL PANELS

A. Exposed-Fastener, Tapered-Rib, Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
      b. Color: As selected by Architect from manufacturer's full range.
   2. Major-Rib Spacing: 12 inches o.c.
   4. Panel Height: 1.25 inches.
   5. McElroy Metal R-Panel or approved equal.

2.5 METAL WALL LINER PANELS

A. Exposed-Fastener, Tapered-Rib, Metal Wall Panels: Formed with raised, classic sine wave corrugation; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

   1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
      b. Color: As selected by Architect from manufacturer's full range.
   2. Major-Rib Spacing: 2.667 inches o.c.
   4. Panel Height: .875 inches.

2.6 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Metal Soffit Panels:
   2. Color: As selected by Architect from manufacturer's full range.
   3. Size: 12" wide, 1" depth.
   4. Shape: Flush seam with beaded pan.
2.7 THERMAL INSULATION

A. Faced Metal Building Insulation: ASTM C991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch-wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

B. Retainer Strips: For securing insulation between supports, 0.025-inch nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

C. Vapor-Retarder Facing: ASTM C1136, with permeance not greater than 0.02 perm when tested according to ASTM E96/E96M, Desiccant Method.

2.8 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
   1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
   1. Gutter Supports: Fabricated from same material and finish as gutters.
   2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot-long sections, complete with formed elbows and offsets.
   1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.
2.9 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.
   1. Mark each piece and part of the assembly to correspond with previously prepared
      erection drawings, diagrams, and instruction manuals.
   2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of
      proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and
   erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with
   baseplates, bearing plates, stiffeners, and other items required for erection welded into place.
   Cut, form, punch, drill, and weld framing for bolted field assembly.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll
   forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required
   for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted
   field connections to primary framing.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by
   manufacturer's standard procedures and processes, as necessary to fulfill indicated performance
   requirements. Comply with indicated profiles and with dimensional and structural requirements.
   1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for
      full length of metal panel.

2.10 SOURCE QUALITY CONTROL

A. Special Inspection: Owner will engage a qualified special inspector to perform source quality
   control inspections and to submit reports.
   1. Accredited Manufacturers: Special inspections will not be required if fabrication is
      performed by an IAS AC472-accredited manufacturer approved by authorities having
      jurisdiction to perform such Work without special inspection.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written instructions and drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building
   system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC
   specifications referenced in this Section. Maintain structural stability of frame during erection.
   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC’s "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Provide supplemental framing at entire perimeter of openings, including doors, windows, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.2 METAL PANEL INSTALLATION, GENERAL

A. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
   a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

B. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
   1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
   1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
   2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
   1. Install ridge and hip caps as metal roof panel work proceeds.
   2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
   1. Install clips to supports with self-drilling or self-tapping fasteners.
   2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
4. Rigidly fasten cave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.
5. Provide metal closures at peaks rake edges rake walls and each side of ridge and hip caps.
6. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
7. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps and on side laps of nesting-type metal panels, on side laps of ribbed or fluted metal panels, and elsewhere as needed to make metal panels weatherproof to driving rains.
8. At metal panel splices, nest panels with minimum 6-inch end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.4 EXTERIOR METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Exposed-Fastener, Tapered-Rib, Metal Wall Panels ("Metal Panel 2"): Formed with raised, classic sine wave corrugation; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
   b. Color: As selected by Architect from manufacturer's full range.
2. Major-Rib Spacing: 2.667 inches o.c.
4. Panel Height: .875 inches.

3.5 INTERIOR METAL LINER PANELS

A. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

B. Exposed-Fastener, Tapered-Rib, Metal Wall Panels: Formed with raised, classic sine wave corrugation; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
   1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
      a. Two-coat fluoropolymer.
      b. Color: As selected by Architect from manufacturer's full range.
   2. Major-Rib Spacing: 2.667 inches o.c.
   4. Panel Height: .875 inches.

3.6 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.7 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
   1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
   2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
   3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:
   1. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
      a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
   2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
   1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.8 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
   3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
   1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
   2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
   1. Provide elbows at base of downspouts to direct water away from building or Tie downspouts to underground drainage system indicated.

E. Circular Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Mount ventilators on flat level base. Install preformed filler strips at base to seal ventilator to metal roof panels.

F. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to metal roof panels.

G. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

H. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.9 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION