D263976

PROPOSAL

Proposal Description:
Tompkins County Sub-Residency, Building & Site Construction.

Letting of 4/24/2019 @ 10:30 A.M.

Submitted in accordance with the Highway Law and the Standard Specifications officially finalized and adopted on January 1, 2019 as posted on the Department’s website.

Book 4 of 8
TECHNICAL SPECIFICATIONS

TOMPKINS COUNTY SUB-RESIDENCY

PIN 3M00.18
D263976
OGS PROJECT NO. SC 647
DATED ISSUED: MARCH 15, 2019
PERMIT SET

VOLUME 2 OF 6

Prepared by:
CHA Consulting, Inc. and Foit-Albert Associates
STATE DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Steel doors and frames, including borrowed lites; sidelights; vision lites; glass moldings and stops; louvers; panels; hardware reinforcements; and accessories as shown in the contract documents.

1.02 REFERENCES

A. ANSI- American National Standard Institute

B. NAAMM National Association of Architectural Metal Manufacturers
   1. HMMA 830-1997 Hardware Preparations and Locations for Hollow Metal Doors and Frames.
   2. HMMA 831-1997 Recommended Hardware Locations for Hollow Metal Doors and Frames.

C. NFPA National Fire Protection Association

1.03 DEFINITIONS

A. Steel Door and Frame Manufacturer: Manufacturer of steel doors and frames regularly engaged in the manufacturing of such products for use in commercial, institutional, educational and other similar applications.

B. Company Field Advisor(s): An employee of the steel door and frame manufacturer who is certified in writing by the manufacturer to be technically qualified in design, installation, and servicing of products.

C. Steel Door and Frame Distributor: Distribution Company who regularly engages in the distribution of steel doors and frames of the manufacturer whose doors and frames are submitted for this project.

D. Certified Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in steel frame and door installation, and is certified in writing by the steel door and frame manufacturer as qualified and responsible to ensure approved steel frames and doors are installed, adjusted, and operate properly.
1.04 SUBMITTALS

A. Waiver of Submittals: "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.

B. Submittals Packages
   1. Door and Frame Schedule and Shop Drawings Package: Submit as a complete package. Incomplete packages will be returned unreviewed.
      a. Quality Assurance Submittal
         1) Certification of Compliance as described in the Quality Assurance Article.
         2) Company Field Advisor’s Qualification Data
            a) Name of Company Field Advisor and Employer’s name, business address and telephone number and e-mail address.
            b) Names and addresses of 3 similar projects Company Field Advisor has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer’s letterhead that Company Field advisor is technically qualified in design, installation, and servicing of the products furnished for this Project.
         3) Certified Supervisor’s and Installer’s Qualification Data
            a) Name of Supervisor and each Installer performing Work, and Employer’s name, business address and telephone number.
            b) Names and addresses of 3 similar projects Supervisor and each Installer has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer’s letterhead that Supervisor/Installer is technically qualified to ensure approved steel frames and doors are installed, adjusted, and operate properly.
      b. Door and Frame Schedule:
         1) Include a Cover Sheet that lists:
            a) Project name, project number, and project address.
            b) Manufacturer’s name, address, and telephone number.
            c) Distributor’s name, address, and telephone number.
            d) Shop drawing preparer’s name, and telephone number and e-mail address.
            e) Submission date.
         2) List by opening
            a) Door and Frame number and location by building and room name. Use same reference numbers for openings and as those shown on Contract Drawings.
            b) Door width, height, thickness, type, gage, and options
            c) Frame type, width, height, jamb depth, gage, anchor type and options.
d) Door and frame elevations; head and jamb profiles and details; welding requirements; and reinforcements.
e) Fire Rating.
f) Glass type.
g) Undercut.
h) Electric preparations, if any.
i) Hardware Set.
j) Show dimensioned elevations; construction details of each door including vertical and horizontal edge details; and frame details for each type, including dimensions profiles; locations for finish hardware, including cutouts and reinforcements; gage of reinforcements; details of connections; anchors and accessories; and details of conduit and preparations for electrified door hardware and controls.

3) Product Data: Manufacturer's catalog sheets, specifications, and detailed installation instructions. Highlight products and options pertaining to this Project. Cross out information irrelevant to this Project.

4) Manufacturer’s Written Certification of Compliance that their products conform to the requirements of the references named in the References Article of this specification section, and as modified by this specification.

5) Samples:
   a) Frames: Corner sample of each type, 18 x 18 inches, with mortises and reinforcements, factory primed or factory finished, as required.
   b) Doors: Corner sample of each type construction, 18 x 18 inches, with mortises and reinforcements, factory primed or factory finished, as required.

2. Closeout Submittals: Submit as a complete package.
   a. Operation and Maintenance Manuals: Furnish 2 (two) hard cover three ring binders with project name and number prominently displayed on the front cover and the spine.
   b. Listing of Manufacturer, address and contact information
   c. Approved Door and Frame Submittal including shop drawings and product data sheets
   d. Manufacturer’s dated warranty for this specific project identified by Facility, OGS project number, and manufacturer’s order number.
   e. Certification: Written certification from the Company Field Advisor that their products are installed according to manufacturer’s printed installation instructions, and are operating properly.

1.05 QUALITY ASSURANCE

A. Uniformity and single source responsibility:
   1. Provide steel doors and frames from a single source manufacturer who specializes in this type of work.
B. Certification of Compliance: A statement, written on steel door and frame manufacturer’s letterhead, that certifies their products, submitted for this Project, have been tested and comply with references named in the References Article of this specification section, and as modified by other requirements this specification.

C. Construction Verification: In order to determine if the products furnished comply with the specifications, the Director may choose one or more doors and frames for examination. The examination may involve cutting doors to expose the internal construction to inspect reinforcements, cores, welds and other construction details.

D. Field Measurements: Verify existing openings by field measurements before fabrication and indicate measurements on shop drawings.

E. Pre-Submittal Conference: Before the steel door and frame submittals are written, the contractor, the steel door and frame distributor, the steel door and frame shop drawing preparer, and the steel door and frame designer shall attend a conference to discuss the contract requirements for the steel door and frame submittal package, including but not limited to, quality assurance items to be submitted, the cover sheet, index, page numbering, schedule formatting, product nomenclature, installation notes, preparations for electric hardware, and product data sheets.

F. Pre-installation Conference: When steel frames are on site, and before steel frame installation begins, the Director’s Representative shall call a conference at the site to review the approved Steel Door and Frame Submittal, approved Finish Hardware Submittals, and proper installation procedures for the Work as well as:
1. Pre-installation inspection of Doors and Frames
   a. Use and coordination of approved Steel Door and Frame submittals with approved Finish Hardware Submittals in the pre-installation inspection process
   b. Reading and understanding manufacturer’s Door and Frame tags
   c. Inspection and verification of labeling and label placement
      1) Specified fire labels (attached metal labels) on doors and frames,
      2) Label locations
      3) Label legibility
   d. Inspection and verification of proper welding of frames
   e. Inspection and verification of hardware reinforcement and preparations in frame head and jambs.
   f. Inspection and verification of required anchors and fasteners.
   g. Inspection and verification of glass kit preparations in doors
   h. Inspection and verification of Electric hardware preparation in frames and doors
2. Review of maximum allowable clearances between frames and doors; doors and floor; and meeting stiles of doors, and verification methods.
3. Verification of plumb, square and level frame installation with jamb rabbets parallel to one another.
4. Review of proper frame installation tools.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames in heavy paper cartons or other protective packaging. Remove any plastic protective wrap from the package.
B. Store doors and frames under cover, in a dry area, on raised platforms in vertical position with minimum 4 inch blocking between units to allow air circulation.

C. Clearly label packaging, and doors and frames, for identification and installation location.

PART 2 PRODUCTS

2.01 MATERIALS


C. Galvannealed Steel Sheets: Zinc Iron Alloy-Coated carbon steel sheets of commercial quality complying with ASTM A 653/653M, with A 60 zinc coating.

D. Anchors and Supports: Fabricate of not less than 16 gage sheet steel unless otherwise indicated.
   1. Galvanized Units: Galvanize anchors and supports to be used with galvanized frames, complying with ASTM A 153, Class B.

E. Anchorage Devices, Bolts, and Other Fasteners: Manufacturer's standard units unless otherwise indicated.
   1. Galvanized Units: Galvanize items and comply with ASTM A 153, Class C or D as applicable.

F. Solid Block polyurethane core with minimum .07 U Factor.

G. Polystyrene slab with a minimum .24 U factor.

H. Extruded polystyrene rigid insulation.

2.02 DOORS

A. General:
   1. Design and Thickness: 2 outer stretcher-leveled steel sheets not less than 14 gage, seamless, hollow construction, 1-3/4 inches thick.
   2. Construct doors with smooth flush surfaces without visible joints or seams on exposed faces or stile edges, except around glass and louver panels. Continuously MIG, ARC or laser weld vertical edges full height of door, grind smooth, and dress to achieve seamless edge. Tack welded, putty filled edges are not acceptable.
   3. Reinforce vertical edges by a continuous steel channel not less than 14ga extending the full height of door.
   4. Close top and bottom of horizontal edges with 14 gage steel channel spot welded to the inside of the face sheets a maximum of 4 inches on center.
   5. Continuously weld the closing end channels to the vertical edge reinforcing channel at all four corners producing a fully welded exterior.
   6. Provide minimum 16 gage flush steel top and bottoms caps, notched at both ends to fit hinge and lock channels, installed with a minimum of 6 welds per cap. Grind welds, body fill and finish smooth.
8. Door Edges: Bevel lock stile edge of single acting hinged doors 1/8 inch in 2 inches. “V” bevel meeting stiles of pairs of doors, except at double egress locations where meeting stiles are parallel.
9. Glazing Stops and Beads: Fixed steel stops, formed integral with door on non-threat side of doors. Removable steel beads, of not less than 14 gage formed steel sheet or solid bar stock, on other side of doors secured with torx head machine screws. Form corners with butted hairline joints. Coordinate width of rabbet between fixed stop and removable bead, and depth of rabbet, with type of glass and glazing required.

B. Fire Rated Assemblies: Wherever a fire resistance classification is shown or scheduled for steel doors and frames; provide fire rated units that have been tested as fire door assemblies, and comply with National Fire Protection Association (NFPA) Standard No. 80 and these specifications.
1. Identify each door and frame with a factory applied metal UL, FM, or WHI label.
2. Label shall remain legible, and shall not be obscured by prime painting or finish painting.
3. Indicate the applicable fire rating on the door label.
4. Locate labels on the hinge edge of door and jamb rabbet of frame.
5. Where continuous hinges are specified, apply labels on the header rabbet of frame and on top exposed edge of door. Locate labels as close to hinge edge as possible.
6. At the manufacturer’s and/or contractor’s expense, retain a third party inspector to recertify fire rated doors and frames, and to replace primed and finish painted labels.

C. Exterior Doors:
1. Fabricate exterior doors with 2 outer stretcher-leveled, A60 galvanized steel sheets.
2. Reinforce inside of doors with the following:
   a. Solid block polyurethane core, with a minimum .37 U factor, that fills the entire door cavity and is chemically bonded to all surfaces.

D. Interior Doors:
1. Fabricate doors with 2 outer stretcher-leveled, A60 galvanized steel sheets.
2. Reinforce inside of doors with polystyrene slab with a minimum .24 U factor, permanently bonded to inside of each face sheet.

2.03 FRAMES

A. General:
1. Furnish steel frames for doors, transoms, sidelites, borrowed lites, and other openings, as shown, of size and profile as indicated.
2. Construction: Full welded unit construction, with corners mitered and continuously welded full depth and width of frame, unless otherwise specified or shown. Knock-down type frames will not be accepted.
   a. Fixed Stops: Integral 5/8 inch stop unless otherwise shown.
   b. Removable Beads: Removable steel beads secured with machine screws. Form corners with butted hairline joints.
3. Do not drill frames for silencers.
4. Weld steel shipping spreaders to the underside of the jamb legs, requiring removal of the spreaders prior to frame installation.

B. Interior and Exterior Frames: Form of hot-rolled steel sheets, not less than 14 gage, zinc alloy iron coated A60 galvannealed.

C. Mullions and Transom Bars:
1. Furnish closed or tubular mullions and transom bars where shown. Fasten mullions and transom bars at crossings and to jambs by butt welding. Reinforce joints between frame members with concealed clip angles or sleeves of same metal and thickness as frame.
2. Where installed in masonry, leave vertical mullions in frames open at the top so they can be filled with grout.

D. Wall Anchors: Unless otherwise specified or shown, formed of not less than 16 gage galvannealed steel.
1. Masonry Construction: Adjustable, corrugated or perforated T-shaped to suit frame size with leg not less than 2 inches wide by 10 inches long. Furnish at least 3 anchors per jamb up to 7’6” jamb height; 4 anchors per jamb up to 8 foot jamb height; one additional anchor per jamb for each 24 inches or fraction thereof over 8 feet high.
2. Steel Stud Construction: Weld-in type welded to back of frame unless otherwise indicated or approved. Furnish at least 4 anchors per jamb up to 7’-6” jamb height; 5 anchors per jamb to 8 foot jamb height; one additional anchor per jamb for each 24 inches or fraction thereof over 8 feet high.
3. Wood Stud Construction: Weld-in type welded to back of frame unless otherwise indicated or approved. Furnish at least 3 anchors per jamb.
4. Anchors for Completed Openings: Anchorage devices designed to secure frame to in-place concrete or in-place masonry construction, as applicable. Furnish at least 5 anchors per jamb up to 7’-6” jamb height; 6 anchors per jamb to 8 foot jamb height; one additional anchor per jamb for each 12 inches or fraction thereof over 8 feet high.

E. Floor Anchors: Furnish floor anchor for each jamb and mullion which extends to floor, formed of not less than 16 gage steel, with 2 holes to receive fasteners, welded to bottom of jamb or mullion, and galvanized if used with galvanized frames

2.04 FABRICATION

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

B. Exposed Fasteners: Countersunk flat, or oval head torx center pin screws and
bolts. Unless otherwise indicated, locate fasteners 2 inches from ends of members and not more than 12 inches apart.

C. Finish Hardware Reinforcements:
1. Minimum 10 gage continuous reinforcement for continuous hinges.
2. Install 7 gage reinforcement for butt hinges, or hinge reinforcement in door edge may be one piece 12 gage channel full door height with extruded hinge screw holes having an average minimum thread pull-out strength of 1600 pounds per hole.
3. Minimum 12 gage reinforcement for other hardware.
4. Weld 14 gage steel tongues, 1-1/2 inches high, inside lock mortise to keep lock body centered in door.
5. Closer reinforce doors and provide full profile closer reinforcement in frames for full width of opening, whether or not closers are specified.

D. Finish Hardware Preparation:
1. Factory prepare doors and frames to receive mortised and concealed hardware, including cutouts; reinforcing; drilling and tapping, in accordance with approved Finish Hardware Schedule and templates furnished by hardware manufacturers.
2. Factory reinforced doors and frames to receive surface applied hardware. Drill and tap for surface applied hardware at project site.

E. Finish Hardware Locations: Locate hardware reinforcements and mortises so hardware locations comply with requirements of HMMA 831, “Recommended Hardware Locations for Custom Hollow Metal Doors and Frames”, and as follows:
1. Knobs, Levers, Crescents: Centerline 3’2” from finished floor.
2. Mortise Deadlocks: Centerline not to exceed 48” above finished floor.

F. Clearances: Fabricate doors for their respective frames within the following clearances:
1. Jambs and Head: 3/32 to 1/8 inch.
4. Bottom (at threshold): 3/8 inch, maximum to top of threshold or carpet.
5. Fire Rated Doors: Comply with clearances specified in NFPA Standard No.80.
6. Measure door clearances from stile edge to jamb.

G. Factory Finish Door Painting:
1. Chemically wash, rinse, and dry exposed and concealed surfaces of fabricated units.
2. Apply one coat of primer with vinyl binder to surfaces and oven-bake units.
3. Units shall be capable of passing the following tests:
   a. Salt Spray Test complying with ASTM B 117-97 for 120 continuous hours.
   b. Water Fog Test complying with ASTM D 1735-97 for 240 continuous hours.
4. Factory pre-finish doors and frames where indicated on the Door Schedule.
   a. Provide custom color(s) as selected by the Director’s Representative.
   b. Provide 3 (three) touch-up paint kits for field repair. Turn over remaining paint to the Facility.
H. Factory Prime Frame Painting:
1. Chemically wash, rinse, and dry exposed and concealed surfaces of fabricated units.
2. Apply one coat of primer with vinyl binder to surfaces and oven-bake units.
3. Units shall be capable of passing the following tests:
   a. Salt Spray Test complying with ASTM B 117-97 for 120 continuous hours.
   b. Water Fog Test complying with ASTM D 1735-97 for 240 continuous hours.

2.05 LOUVERS

A. Provide louvers for interior doors, where indicated, which comply with SDI 111, with blades or baffles formed of 18 GA. thick, cold-rolled steel sheet set into 22 GA. thick steel frame.

   1. Manufactures:
      a. Allegion
      b. Anemostat Door Products
      c. Grainger

   2. Type: Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.

B. Form corners of moldings with hairline joints. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine substrates, areas and conditions, with installer present under which frames are to be installed for defects that will adversely affect execution and quality of Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Prior to installation adjust and securely brace door frames for squareness, alignment, twist, and plumb to the following tolerances:

   1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
   3. Twist: Plus or minus 1/16”, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   4. Plumbness: Plus or minus 1/16 inch, measured at jamb face on a perpendicular line from head to floor.
B. Drill and tap doors and frames to receive non-templated mortised and surface mounted hardware.

3.03 INSTALLATION

A. General: Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

1. Frames: Install frame of size and profile indicated. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set.
   a) Remove temporary braces necessary for installation only after frames have been properly set and secured.
   b) Check plumb, squareness, and twist of frames as walls are constructed. Adjust as necessary to comply with installation tolerances.

2. Installation Tolerances: Adjust 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. Doors: Fit non-fire-rated doors accurately in frames with the following clearances:
   1. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
   2. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

3.04 CLEANING AND TOUCHUP

A. Retain "Prime-Coat Touchup," "Metallic-Coated Surface Touchup," or "Factory-Finish Touchup" Paragraph below for field touchup of painted surfaces; or delete all and retain "Touchup Painting" Paragraph below if touchup is included in painting Sections.

B. 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.

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

D. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

ADJUSTING AND FINAL CLEANING

A. Final Adjustments:
1. Check and readjust operating hardware items immediately before final inspection.
2. Leave work in complete and proper operating condition.
3. Remove and replace defective work including doors or frames that are warped, bowed, or otherwise unacceptable.

B. Clean foreign materials off steel doors and frames immediately after installation.

3.05 FINAL INSPECTION

A. Upon completion of the project, the Director’s representative will schedule a final inspection to verify doors and frames are properly installed and adjusted. The contractor, door and frame installer, and design representative will attend.

B. Upon verification, the design representative will certify in writing components are properly installed and adjusted within referenced tolerances in accordance with this specification. Include this certification in the Close-out Submittals.

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Fiberglass reinforced plastic (FRP) doors.
B. Frames for fiberglass reinforced plastic doors.
C. Glazing.
D. Accessories.

1.02  RELATED REQUIREMENTS

A. Section 087100 - Door Hardware: Door hardware not furnished by door manufacturer.
B. Section 088100 - Glass and Glazing.

1.03  REFERENCE STANDARDS

C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014.

1.04  ADMINISTRATIVE REQUIREMENTS

A. Air/Water-Resistive Barrier Coordination: Receive instructions for sealing exterior frames to air/water-resistive barrier specified in Section 07 2400.

1.05  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard details, installation instructions, and hardware and anchor recommendations.
   I. Include door detailing internal construction and reinforcements, materials used and description of assembly process.
C. Shop Drawings: Show layout and profiles; include assembly methods.
   1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
   2. Indicate wall conditions, door and frame elevations, sections, materials, gages, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on Drawings to identify details and openings.

D. Verification Samples: Submit door surface samples for each finish specified, 10 inch by 10 inch in size, illustrating finishes, colors, and textures.

E. Installation Instructions: Include manufacturer's specific information describing procedures, sequence and required fasteners for frame and door installation.

F. Maintenance Data: Include instructions for repair of minor scratches and damage.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer; include detailed terms of warranty.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Mark doors with location of installation, door type, color, and weight.

B. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
   1. Upon receipt of shipment, remove and inspect the doors and frames for damage. Note any damage on the shipping papers prior to accepting.

C. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
   1. Store at temperature and humidity conditions recommended by manufacturer.
   2. Do not use non-vented plastic or canvas shelters.
   3. Immediately remove wet wrappers.

D. Store in position recommended by manufacturer, elevated minimum 4 inch above grade, with minimum 1/4 inch space between doors.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide ten (10) year manufacturer warranty covering materials and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Laminated Fiberglass Doors:
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOOR AND FRAME ASSEMBLIES

A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
1. Door and frame pre-assembled; shipped with braces, spreaders, and packaging as required to prevent damage.
2. Mechanical Durability: Tested to ANSI/SDI A250.4 Level A (1,000,000 cycles), minimum; tested with hardware and fasteners intended for use on project.
3. Screw-Holding Capacity: Tested to 900 psi, minimum.
4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A; when tested in accordance with ASTM E84.
5. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
6. Sizes: As indicated on drawings.
7. Clearance Between Door and Frame: 1/8 inch, maximum.
9. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.

2.03 COMPONENTS

A. Doors: Through-color gel coating on fiberglass reinforced polyester resin construction with reinforced core.
2. Door Construction: Fiberglass faces laminated to core, stiles and rails with subsequently applied gel coating.
   a. Face Thickness: 0.120 inch.
4. Reinforcements: Solid high-density urethane shapes, chemically welded at factory.
5. Core:
   a. Exterior Doors: Foam, 2 pcf expanded polystyrene (EPS) or 6 psf urethane.
      1) Door Thermal Resistance: U-factor of 0.18, maximum.
   b. Interior Doors: Polypropylene honeycomb.
6. Waterproof Integrity: All edges, cut-outs, and hardware preparations factory fabricated of fiberglass reinforced plastic; provide cut-outs with joints sealed independently of glazing.
7. Hardware Preparations: Factory reinforce, machine, and prepare for all hardware including field installed items; provide solid blocking for each hardware item; make field cutting, drilling or tapping unnecessary; obtain manufacturer's templates for hardware preparations.
8. Bottom Rail: Provide height necessary to allow up to 1-1/4 inches to be field cut off bottom of door without impairing door strength or durability.
9. Gel Coating: Ultraviolet stabilized polyester, with pebbled texture.
   b. Color: As selected by the Architect from the manufacturer's full line of colors.
2.04 ACCESSORIES

A. Glazing Stops: Pultruded fiberglass; provided by door manufacturer to fit factory made openings, color and texture to match door; fasteners not penetrating waterproof integrity.
   1. Glazed Openings: Provide removable stops on one side.
   2. Opening Sizes: As indicated on drawings.

B. Glazing: As specified in Section 08 8000.

C. Hardware: As specified in Section 08 7100, except the following to be provided with doors.
   1. Door Pulls: Door manufacturer standard recessed, ADA Standards compliant. Aluminum with clear finish.
      a. Nominal Dimensions: 7 inches high by 2 inches wide grip surface; 1-3/8 inch recess
      a. Nominal Dimensions: 12 inches high by 3 inch wide; 0.050 inch thick.
   3. Thresholds: Pultruded fiberglass, with skid resistant surface, full width of door opening, 1/2 inch high by 6 inches wide; same color as frame.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify actual dimensions of openings by field measurements before door fabrication; show recorded measurements on shop drawings.
B. Do not begin installation until substrates have been properly prepared.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.
B. Install fire-rated assemblies in accordance with NFPA 80.
C. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.
D. In masonry walls, install frames prior to laying masonry; anchor frames into masonry mortar joints; fill jambs with grout as walls are laid up.

3.03 ADJUSTING

A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.
B. Adjust hardware for smooth and quiet operation.
C. Adjust doors to fit snugly and close without sticking or binding.

3.04 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION
PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE
A. Padlocks: Section 087100.
B. Field Painting: Section 099659.
C. Wiring for Motors and Motor Controllers: Section 260523.

1.02 REFERENCES
A. Sheet Steel Gages: US Standard gage.

1.03 PERFORMANCE REQUIREMENTS
A. Wind Loading: Rolling doors shall withstand a wind loading pressure of 20 psf without damage to door assembly.
B. Counterbalance Assembly Shaft Deflection: Shall not exceed 0.03 inch per foot of span.

1.04 SUBMITTALS
A. Shop Drawings: Show application to project.
B. Product Data: Catalog sheets, specifications, and installation instructions for rolling service door assemblies, rolling fire door assemblies, finishes, and operators.
   1. Include complete data covering motors and controls for electric operation.
   2. For each releasing device control panel, include:
      a. Electrical parameters.
      b. Detailed wiring diagram and written description showing and explaining proposed method of operation. (Format similar to fire door operation summarized under Releasing Device Control Panel specification.)
      c. Interconnection requirements for using the releasing device control panel in conjunction with the fire alarm system (or other specified initiating systems).
C. Samples: Curtain slat, 1 foot long end piece.
D. Contract Closeout Submittals:
   1. Operation and maintenance data.
   2. Replacement parts list.
PART 2   PRODUCTS

2.01 ROLLING DOORS

A. Complete overhead coiling door assemblies sized and arranged to suit opening sizes, conditions, and clearance limitations indicated on the Drawings.

2.02 INSULATED CURTAIN

A. Interlocking flat slats of cold roll formed ASTM A 653 galvanized sheet steel, with enclosed insulation.

1. Slat Construction: Sandwich type meeting the requirements of one of the following:
   a. 2-5/8 inches high by 7/8 inch deep, 20 gage galvanized steel face and interlocking 22 or 24 gage galvanized steel back, completely enclosing foamed-in-place rigid polyurethane insulation permanently bonded to the metal. Slat shall be completely filled with insulation.
   b. 2-5/8 inches high by 3/4 inch deep, 20 gage galvanized steel face and interlocking 24 gage galvanized steel back, completely enclosing a 5/8 inch thick glass fiber reinforced closed cell rigid polyisocyanurate foam insulation board faced on both sides with aluminum foil.
   c. 2-5/8 inches high by 7/8 inch deep, 20 gage galvanized steel face and interlocking or snap-on 28 gage or heavier galvanized steel back cover, completely enclosing a 11/16 inch thick rigid polyurethane insulation board contoured to closely fill slat void.
   d. 2-5/8 inches high by 5/8 inch deep, 20 gage galvanized steel face with self-locking rigid PVC extruded back cover, encasing a 3/4 inch thick by 1-3/4 inch rigid expanded polystyrene foam insulation board. Back cover shall be securely bonded to steel face with adhesive and galvanized steel plates.

2. Slat Engagement Into Guides: Not less than 2 inches.
3. Endlocks: Malleable iron; riveted to each end of each slat.
4. Windlocks: Malleable iron; riveted to each end of alternate slats for doors 10 feet or more in width.
5. Bottom Bar: Galvanized steel angles not less than 1/8 inch thick, one each side, fastened with Type 316 stainless steel bolts and nuts.

2.03 GUIDES

A. Steel angles or sections, not less than 3/16 inch thick; upper ends flared or fitted with cast iron bellmouth for smooth curtain entry; depth sufficient for specified slat engagement; with windlock stop for curtains with windlocks.

2.04 END BRACKETS

A. Cast iron or steel, formed to close ends of hood, with self-aligning ball-bearing counterbalance supports.
2.05 COUNTERBALANCE ASSEMBLY

A. Springs: Helical wound oil-tempered steel torsion springs, designed with 25 percent overload factor, mounted on a cold rolled steel inner shaft.

B. Roller Shaft/Spring Enclosure: Steel pipe designed to support curtain and counterbalance mechanism within specified deflection tolerance.

C. Adjusting Device: Spring tension setting wheel, readily accessible.

D. Mechanism within pipe shaft shall be grease-packed.

2.06 HOOD

A. Not less than 24 gage galvanized sheet steel, reinforced top and bottom with stiffening returns.
   1. Hoods over 14 feet long shall have intermediate hood supports.

2.07 WEATHERSTRIPPING

A. Sill: Compressible and removable, neoprene tubular seal or looped astragal, attached to bottom bar.

B. Jambs: Continuous neoprene or vinyl baffle, attached to guide assemblies.

C. Head: Continuous neoprene or vinyl weather baffle, attached to door head or lintel.

D. Hood: Continuous neoprene or vinyl hood baffle, attached to inside of hood.

2.08 FINISHES

A. Galvanizing: Unless otherwise specified or noted, items indicated to be galvanized shall receive a zinc coating by the hot-dip process, after fabrication, complying with the following:
   3. Plain and Fabricated Material, and Assembled Products: ASTM A 123.

B. Shop Painting: Paint complete door assemblies unless otherwise indicated.
   1. Galvanized Surfaces: Phosphate treatment, and manufacturer’s standard rust inhibitive metal primer coat.
   2. Ferrous Metal Surfaces: Manufacturer’s standard rust inhibitive metal primer coat after cleaning.
2.09 MANUAL OPERATION

A. Chain Hoist Operator:
   1. Gear reduction drive, endless cadmium-plated alloy steel hand chain, mounted on counterbalance shaft, operating with not more than 35 pounds pull.
   2. Gears cast from machine-cut patterns.
   3. Chain locking bracket.

B. Crank Hoist Operator: Wall crank.
   1. Enclosed cast crank box, reduction gearing, and shafting; removable hand crank located 3 feet above floor.
   2. Gears cast from machine-cut patterns.
   3. Locking disc on crank box.

2.10 ELECTRIC OPERATION

A. General: UL listed electric operator assembly, complete with operator/motor unit, factory prewired motor controller, limit devices, and remote control stations. Motor shall be removable without disturbing the limit switch adjustment and without affecting the emergency release mechanism.

B. Side-Mounted Operator: Heavy duty gear hoist type (worm and gear reduction drive in oil bath), solenoid operated brake, emergency release mechanism with chain hoist for manual operation, and interlock device to prevent motor from operating when release mechanism is activated.

C. Motor: Horsepower rating as required to open and close door at a speed not less than 0.67 fps without overload under any condition of operation.
   1. Motors shall comply with NEMA standards.
   2. Motors shall be designed to operate on single phase, 60 Hertz, 120 volt circuit (NEMA standard motor voltage 115V), not exceeding ½ HP.
   3. Bearings: Equip motors 1/2 HP and larger with ball bearings.
   4. Housing: Drip-proof.

D. Reversing Magnetic Motor Controller:
   2. Enclosure: NEMA 1 except for controllers mounted in salt-rich environments, which are to be NEMA 4X stainless steel. Refer to electrical drawings for locations.
   3. Control Power: Control power transformer (maximum control voltage 120 volts) mounted within motor controller enclosure.

E. Remote Control Stations (Interior): Momentary-contact, 3 push buttons labeled OPEN, CLOSE, STOP.
   1. Enclosure: NEMA 1, surface mounted unless otherwise indicated.
F. Safety Edge Device: Electric or pneumatic/electric safety switch, extending full width of door bottom, located within a rubber or neoprene astragal mounted to bottom bar. Upon contact with any obstruction, safety edge device shall immediately stop the downward travel of the door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine door openings for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer’s printed instructions, except as shown or specified otherwise.
   1. Field connections and fastening shall be as recommended by the door manufacturer for the conditions, unless otherwise indicated.
   2. Install bracing and supports as necessary to rigidly secure door operating equipment and appurtenances.
   3. Install junction box for wiring of safety edge device at mid-point of door travel. Connect flexible wiring to safety edge device and junction box with strain relief grips.

3.03 FIELD QUALITY CONTROL

A. Tests:
   1. Test all functions and features of each rolling door.

3.04 ADJUSTING

A. Adjust and lubricate doors and operating equipment to operate smoothly. Adjust door fit and weatherstripping to make a weathertight fit for the door perimeter.

B. Repair cut, welded, and abraded galvanized surfaces with a minimum 2 mil thick coating of cold galvanizing compound (containing 93 percent zinc) applied in accordance with manufacturer’s instructions.

3.05 CLEANING

A. Clean doors, and clean work area surfaces that have been soiled performing the Work.

END OF SECTION
SECTION 083325
COMPOSITE SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Lock Cylinders: Section 087100.
B. Padlocks for Chain Hoists: Section 087100.
C. Field Painting (High Build Glazed Coatings): Section 099659
D. Wiring for Motors and Motor Controllers: Section 260523.

1.02 REFERENCES

A. Sheet Steel Gages: U.S. Standard gage.

1.03 PERFORMANCE REQUIREMENTS

A. Wind Loading: Sectional overhead doors shall withstand a wind loading pressure of 20 psf minimum without damage.
B. Deflection: Maximum deflection of door in horizontal position shall be 1/120 of door width.
C. Thermal Transmission: Door section U value shall be 0.058 or less, tested in accordance with ASTM C 236 by an independent testing laboratory. (R value 17 or more.)
D. Air Infiltration: Rating shall be 0.15 or less cu ft/min per sq ft of door area, tested in accordance with ASTM E 283 at a pressure difference of .112 inch H2O (15 miles/hr) by an independent testing laboratory.

1.04 SUBMITTALS

A. Shop Drawings: Show application to project.
B. Product Data: Catalog sheets, specifications, installation instructions for overhead door assemblies, finishes, and operators.
   1. Include complete data covering motors and controls for electric operation.
C. Sample: Full door section end, 1 foot long.
D. Quality Control Submittals:
   1. Certificates: Furnish door manufacturer’s certifications that the spring life of counterbalance mechanism is 50,000 cycles or more, the door section U value is 0.058 or less, and the R value is 17 or more.

E. Contract Closeout Submittals:
   1. Operation and maintenance data.
   2. Replacement parts list.

PART 2 PRODUCTS

2.01 DOORS

A. Complete sectional overhead door assemblies with door sections, tracks and appurtenances sized and arranged to suit opening sizes, conditions, and clearance limitations indicated on the Drawings.
   1. Door manufacturer’s standard height door sections may be used, except when a trimmed closure section is necessary to fit the opening height.

2.02 DOOR SECTIONS

A. Type: Steel section enclosing and bonded to a solid core of polyurethane or polystyrene insulation, and forming a composite rigid panel with a minimum thickness of 1-5/8 inches.

B. Steel Section:
   1. Exterior Face: Minimum 20 gage thick hot-dipped galvanized steel with horizontal embossed ribs, and factory painted with primer and polyester or acrylic finish coat; or minimum 20 gage thick steel with horizontal embossed ribs, protected with an aluminum/zinc corrosion-resistant coating, and factory painted with a baked-on enamel finish coat.
      a. Color: As selected from door manufacturer’s standard colors.
   2. Interior Face: Minimum 20 gage thick hot-dipped galvanized steel with horizontal ribs, and factory painted with primer and polyester finish coat; or minimum 20 gage thick steel with horizontal ribs, protected with an aluminum/zinc corrosion-resistant coating, with paint finish to match the exterior face.
   3. Core: Tightly packed polyurethane or polystyrene insulation.
   4. End Caps: 16 gage minimum, hot-dipped galvanized steel closures, with a paint finish to match exterior face.
   6. Fabrication and Manufacture:
      a. Each face shall be fabricated from a single steel sheet and meeting edges of door sections shall be formed with a rabbeted or keyed weather seal.
      b. Insulation shall be placed between the metal faces in a manufacturing process which will bond the insulation to the
metal and completely fill the space within the door section, resulting in a rigid metal/insulation/metal sandwich construction.

c. Each door section shall be reinforced with continuous reinforcing as required by door width and wind loading and deflection requirements. Reinforce bottom section as required by weight of door. Reinforcement shall be galvanized steel strips, bars, struts or trusses, and securely bolted, riveted or welded in place if not an integral part of door section.

C. Vision Panels: Aluminum Sash Section with Glazing. Size: Approximately 24 x 10 inches each.
2. Glazing: 1/2 inch, insulated glazing unit with low E coating. Two 1/8 inch thick acrylic sheets separated by an air space, set in a weathertight extruded rubber gasket or molded polymer frame.

2.03 ACCESSORIES

A. Door Drop Safety Device: Safety device mounted to the bottom roller assembly on each side of door which will automatically prevent the door from falling if the cable breaks. Safety device shall allow for full opening of the door, with the door clear of (above) door opening.

B. Weatherstripping, comply with the air infiltration rating specified:
1. Sill: Compressible and replaceable; rubber, PVC or vinyl tubular astragal, attached to bottom of door.
2. Jambs: Rubber, high density polyethylene or vinyl seals which will prevent metal to metal contact.
3. Head: Rubber, PVC or vinyl seal, attached to door or head, designed to provide a firm seal between door and head regardless of exterior/interior temperature variances.
4. Door Section Joints: Rubber, PVC or vinyl gasket in joints of meeting edges.
5. Securely attach sill, jamb, and head weatherstripping with metal fasteners or approved retainers; adhesive application will not be acceptable.

2.04 TRACKS, SUPPORTS, AND BUMPERS

A. Tracks and Reinforcement: Galvanized steel tracks and reinforcement. Reinforce vertical tracks with heavy duty mounting brackets 16 inches oc or continuous steel angles welded or through bolted to track. Incline vertical tracks or otherwise design to ensure weathertight closure at jambs when door unit is closed. Reinforce horizontal tracks with continuous steel angles welded to track. Track system shall allow for normal door movement caused by temperature changes.
1. Track Size: 3 inches.

B. Track Supports: Galvanized steel shapes, except as otherwise indicated.
C. Door Bumpers: Compression spring or leaf spring bumper located at the end of each horizontal track, designed to cushion and stop door at end of opening operation.

2.05 HARDWARE

A. Hinges and Roller Brackets: Minimum 13 gage steel hinges at each end cap, and at intermediate locations as recommended by door manufacturer. Fabricate hinges at end caps for mounting of rollers. Attach hinges to door sections with self-tapping fasteners. Doors exceeding 12 feet in width or 385 pounds in weight shall have double end hinges.

B. Rollers: Heavy duty rollers with steel ball bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Where double hinges are required, extend roller shaft through both hinges. Roller tires shall suit size of track and be the following type:
   1. Tires: Steel tires, sized to suit track, except as otherwise indicated.

C. Locking Device: Assembly with keyed spring-loaded dead bolt lock, chromium-plated operating handle(s), cam plate, and adjustable locking bar to engage through slots in track.
   1. Locking Bar: Cremone type, operable from inside and outside.

D. Finish: Galvanized, unless otherwise indicated.
   1. Fasteners: Galvanized, cadmium plated or stainless steel, and compatible with door material.

2.06 COUNTERBALANCING MECHANISM

A. Type: Torsion spring counterbalance mechanism consisting of helical wound oil-tempered steel torsion springs having a minimum spring life of 25,000 cycles, mounted on a solid steel keyed shaft, and connected to door with aircraft quality grade galvanized steel lift cable having a minimum safety factor of 7 to 1. Required operation force shall not exceed the following:
   2. Chain Hoist Operation: 35 lb pull, maximum.

B. Drums and Brackets: Cast aluminum or grey iron casting cable drums, grooved to receive and hold proper diameter cable. Counterbalance mechanism shall be mounted with adjustable ball-bearing brackets at each end of shaft and one additional mid-point bracket for shafts up to 16 feet long and 2 additional brackets at 1/3 points to support shafts over 16 feet long, unless closer spacing recommended by door manufacturer.

2.07 CHAIN HOIST OPERATION

A. Chain Hoist Operator: Gear reduction drive chain hoist unit, side-mounted on counterbalance shaft, including an endless cadmium-plated alloy steel hand
chain, cast iron pocket wheel and guard, reduction unit of at least 3 to 1, and roller chain and sprocket drive.

1. Chain Locking Device: Keeper type, for use with padlock, operated from inside. Locking device shall be located 3 feet above floor.

2.08 ELECTRIC OPERATION

A. UL listed electric operator assembly, complete with operator/motor unit, factory pre-wired motor controller, limit devices, and remote-control stations. Motor shall be removable without disturbing the limit switch adjustment and without affecting the emergency release mechanism.

B. Trolley/Drawbar Operator: V-belt or gear primary drive to suit door load and job conditions, chain and sprocket secondary drive, adjustable safety clutch, solenoid operated brake, emergency release mechanism with an auxiliary steel chain hoist which can be engaged/disengaged from floor level for mechanical operation, provide an interlock device to prevent motor from operating when release mechanism is activated. Chain to remain motionless during electric operation.

1. Reinforce door section for operator attachment.

C. Jackshaft/Hoist Operator: Side-mounted or center-mounted with V-belt, chain or gearhead primary drive to suit door load and job conditions, roller chain secondary drive, adjustable safety clutch, solenoid operated brake, emergency release mechanism with an auxiliary steel chain hoist which can be engaged/disengaged from floor level for mechanical operation, provide an interlock device to prevent motor from operating when release mechanism is activated. Chain to remain motionless during electric operation.

D. Gear Hoist Operator: Side-mounted or center-mounted with heavy duty worm and gear reduction drive in oil bath, solenoid operated brake, emergency release mechanism with an auxiliary steel chain hoist which can be engaged/disengaged from floor level for mechanical operation, and provide interlock device to prevent motor from operating when release mechanism is activated. Chain to remain motionless during electric operation.

E. Motor: Horsepower rating as required to open and close door at a speed not less than 3/4 foot or more than 1-1/4 feet per second without overload under any condition of operation.

1. Motors shall comply with NEMA standards.
2. Motors shall be designed to operate on single phase, 60 Hertz, 120 volt circuit (NEMA standard motor voltage 115V), not exceeding ½ HP.
3. Mount motor separate from reduction mechanism.
4. Bearings: Equip motors 1/2 HP and larger with ball bearings.
5. Housing: Drip-proof.

F. Reversing Magnetic Motor Controller:

2. Enclosure: NEMA 1 except for controllers mounted in salt-rich environments, which are to be NEMA 4X stainless steel. Refer to electrical drawings for locations.

3. Control Power: Control power transformer (maximum control voltage 120 volts) mounted within motor controller enclosure.

G. Remote Control Stations (Interior): Momentary-contact, 3 push buttons labeled OPEN, CLOSE, STOP.
   1. Enclosure: NEMA 1, surface mounted unless otherwise indicated.

H. Safety Edge Device: Electric or pneumatic/electric safety switch, extending full width of door bottom, located within a neoprene or vinyl astragal mounted to bottom rail. Contact with safety edge device shall immediately stop the downward travel of the door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine door openings for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install the Work of this Section in accordance with manufacturer’s printed instructions, except as shown or specified otherwise.
   1. Field connections and fastening shall be as recommended by the door manufacturer for the conditions, unless otherwise indicated.

B. Secure and support tracks as required to prevent sag, sway, and detrimental vibration during opening and closing of door.
   1. Fasten vertical track assembly to framing with continuous steel angles 24 inches oc, or with mounting brackets 16 inches oc.
   2. Support horizontal (ceiling) track assembly with laterally-braced hanger at end of track, secured to overhead structural members. For doors 10 feet high and over, install an additional laterally-braced hanger at the center of horizontal tracks. Also secure horizontal track reinforcement at wall.

C. Install bracing and supports as necessary to rigidly secure door operating equipment and appurtenances.
D. Install junction box for wiring of safety edge device at mid-point of door travel. Connect flexible wiring to safety edge device and junction box with strain relief grips.
   1. Install flexible wiring to be free from obstruction, with no excess wiring, when door is fully opened or fully closed.

E. Coordinate location of chains or pulls so they will not interfere with door operation.

3.03 ADJUSTING

A. Adjust and lubricate doors and operating equipment to operate smoothly. Adjust door fit and weatherstripping seals to make a weathertight fit for the door perimeter.

B. Repair cut, welded, and abraded galvanized surfaces with a minimum 2 mil thick coating of cold galvanizing compound (containing 93 percent zinc) applied in accordance with compound manufacturer’ instructions.

3.04 FIELD QUALITY CONTROL

A. Test all doors for proper operation of radio control units. Turn units over to the Director’s Representative after testing.

3.05 CLEANING

A. Clean doors, and clean work area surfaces that have been soiled performing the Work.

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes: Storefront framing.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

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

B. Shop Drawings: For aluminum-framed storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
   1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   2. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed storefronts, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.
   3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

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

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

E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
   1. Joinery, including concealed welds.
   2. Anchorage.
5. Flashing and drainage.

F. Delegated-Design Submittal: For aluminum-framed storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Energy Performance Certificates: For aluminum-framed storefronts, accessories, and components, from manufacturer.
   1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed storefront.

C. Product Test Reports: For aluminum-framed storefronts, for tests performed by a qualified testing agency.

D. Quality-Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C1401. Include periodic quality-control reports.

E. Source quality-control reports.

F. Sample Warranties: For special warranties.

1.06 CLOSEOUT SUBMITTALS

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

1.07 QUALITY ASSURANCE

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

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
   1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.08 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures, including, but not limited to, excessive deflection.
b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Basis of Design Product Trifab VG 451T Framing System
   2. Tubelite Inc.

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

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
   1. Aluminum-framed 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.

C. Structural Loads:
1. Wind Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:
1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of clear span for spans of up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller 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 (3.2 mm).
   a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.

E. Air Infiltration: Test according to ASTM E283 for infiltration as follows:
1. Fixed Framing and Glass Area:
   a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa).

F. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 8 lbf/sq. ft. (380 Pa) as defined in AAMA501.

G. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor of not more than 0.43 Btu/sq. ft. x h x deg F (2.55 W/sq. m x K) as determined according to NFRC 100.
2. Condensation Resistance: Fixed glazing and framing areas as a system shall have an AAMA Specification 1503, condensation resistance shall not be less than:
   a. Glass to Exterior – 70 frame and 69 glass (low-e).
   b. Glass to Center – 62 frame and 68 glass (low-e).
   c. Glass to Interior – 56 frame and 67 glass (low-e).

H. Noise Reduction: Test according to ASTM E90, with ratings determined by ASTM E1332, as follows:

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
1. Temperature Change: 0 deg F (-18 deg C), ambient; 180 deg F (82 deg C), material surfaces.
2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
   a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
   b. Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C).

2.03 Storefront Systems

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads. Kawneer North America; Basis of Design Product Trifab VG 451T Framing System
   2. Interior Vestibule Framing Construction: Nonthermal.
   5. Finish: Clear anodic finish.
   6. Fabrication Method: Field-fabricated stick system.
   7. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   8. Steel Reinforcement: As required by manufacturer.

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

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

2.04 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. Comply with Section 088000 "Glazing."

C. Glazing Sealants: As recommended by manufacturer. Comply with Section 088000 "Glazing."

D. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.
2.05 MATERIALS

A. Sheet and Plate: ASTM B209 (ASTM B209M).
B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221 (ASTM B221M).
C. Extruded Structural Pipe and Tubes: ASTM B429/B429M.
D. Structural Profiles: ASTM B308/B308M.
E. 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.
   4. 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 according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.06 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   2. Reinforce members as required to receive fastener threads.
   3. Use concealed fasteners to ever extent possible. Where exposed fasteners are necessary do so with countersunk Phillips screw heads, finished to match framing system.
B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
   1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
C. Concealed Flashing: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding flashing compatible with adjacent materials.
D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.
E. Rigid PVC Filler.

2.07 FABRICATION

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

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

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

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

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

2.08 ALUMINUM FINISHES

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

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation
tolerances and other conditions affecting performance of the Work.

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

3.02 PREPARATION

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

3.03 INSTALLATION

A. General:
   1. Comply with manufacturer's written instructions.
   2. Do not install damaged components.
   3. Fit joints to produce hairline joints free of burrs and distortion.
   4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

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

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

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

E. Retain first paragraph below for operable units.

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

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

H. Retain paragraph below if Project includes two-sided structural glazing.

I. Install weatherseal sealant according to Section 079200 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

3.04 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed storefronts to comply with the following maximum tolerances:

1. Erection tolerances in subparagraphs below are examples only that are based on various AAMA references. Coordinate with tolerances for support systems and revise to suit Project.

2. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).

3. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).

4. Alignment:
   a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
   b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
   c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
5. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes aluminum-framed assemblies glazed with multiwalled (structured) polycarbonate panels as follows:
   1. Wall Assemblies.

B. Related Sections include the following:
   1. List below only products and construction that the reader might expect to find in this Section but are specified elsewhere
   2. Division 07 Section "Thermal Insulation" for insulation materials field installed with assemblies.
   3. Division 07 Section "Sheet Metal Flashing and Trim" for metal flashings installed at perimeters of assemblies.
   4. Division 07 Section "Joint Sealants" for sealants installed at perimeters of assemblies.
   5. Division 08 Section "Metal-Framed Skylights" for aluminum-framed skylights that retain glass or plastic glazing using retaining caps or structural sealant.

1.03 PERFORMANCE REQUIREMENTS

A. Provide assemblies, including anchorage, capable of withstanding, without failure, the effects of the following:
   1. Structural loads.
   2. Thermal movements.
   3. Movements of supporting structure.
   4. Specify dimensional tolerances for support system and adjacent construction in other Sections of this Project's Specifications.
   5. Dimensional tolerances of building frame and other adjacent construction.

B. Failure includes the following:
   1. Deflection exceeding specified limits.
   2. Water leakage.
   3. Thermal stresses transferred to building structure.
   4. Noise or vibration created by wind and thermal and structural movements.
   5. Loosening or weakening of fasteners, attachments, and other components.

C. Structural Loads: - Refer to structural drawings for required loading.
D. Show structural design data determined by Project's structural engineer on Drawings or insert requirements in applicable subparagraphs below. Verify requirements of authorities having jurisdiction. See "Design Loads, General" Article in the Evaluations in Division 08 Section "Translucent Wall and Roof Assemblies."

E. Deflection of Assemblies:
1. Vertical Assemblies: Limited to 1/100 of clear span for each assembly component.
2. Overhead Assemblies: Limited to 1/180 of clear span for each assembly component.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.04 PERFORMANCE TESTING

A. Provide assemblies that comply with test-performance requirements indicated, as evidenced by reports of tests performed on manufacturer's standard assemblies by a qualified independent testing agency.

B. Structural-Performance Test: ASTM E 330.
1. Performance at Design Load: When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. Performance at Maximum Test Load: When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main supporting members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity but not less than 10 seconds.

C. Air-Infiltration Test: ASTM E 283.
2. Maximum Air Leakage: 0.1 cfm/sq. ft.

D. Test for Water Penetration under Static Pressure: ASTM E 331.
1. Minimum Static-Air-Pressure Difference: 20 percent of positive wind-load design pressure, but not less than 15 lbf/sq. ft.
2. Water Leakage: None.

1.05 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for assemblies.

B. Shop Drawings: For assemblies. Include plans, elevations, sections, details, and attachments to other work.
1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

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

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

E. Fabrication Sample: Of each framing system intersection of assemblies, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
   1. Joinery.
   2. Anchorage.
   4. Structured polycarbonate panels.
   5. Flashing and drainage.

F. Field quality-control test reports.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for assemblies.

H. Preconstruction Testing Program: For assemblies, developed specifically for Project. Include plans, elevations, sections, and details of laboratory mockup.

I. Preconstruction Test Reports: For assemblies.

J. Maintenance Data: For assemblies to include in maintenance manuals.

K. Warranties: Special warranties specified in this Section.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Entity capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.

B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 699 for testing indicated.

C. Product Options: Information on Drawings and in Specifications establishes requirements for assemblies' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including testing conducted by an independent testing agency and in-service performance.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
D. Fire-Test-Response Characteristics: Where fire-test-response characteristics are indicated for assemblies and components, provide products identical to those tested per test method indicated by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

E. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."

F. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Build mockup of typical assembly area as shown on Drawings.
   2. Field testing shall be performed on mockups according to requirements in Part 3 "Field Quality Control" Article.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.07 PROJECT CONDITIONS

A. Field Measurements: Indicate measurements on Shop Drawings.

1.08 WARRANTY

A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer and Installer agree to repair or replace components of assemblies that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      c. Water leakage.
   2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Structured-Polycarbonate-Panel Warranty: Manufacturer's standard form agreeing to replace polycarbonate sheet that breaks or develops defects from normal use that are attributed to manufacturing process and not to practices for maintaining and cleaning products contrary to manufacturer's written instructions.
   1. Defects include, but are not limited to, the following:
      a. Delamination.
      b. Color changes from original in excess of 3.0 units Delta E when measured per ASTM D 2244.
      c. Losses in light transmission beyond 6 percent from original when measured per ASTM D 1003.
   2. Warranty Period: 10 years from date of Substantial Completion.

C. Special Aluminum-Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: The design for assemblies is based on Wasco LumiWall Vertical Translucent Panel System. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
   1. CPI International.
   2. Extech, Inc.

2.02 ALUMINUM FRAMING SYSTEMS

A. Aluminum: Alloy and temper recommended in writing by manufacturer for type of use and finish indicated.
   2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).

B. Components: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
   1. Construction: Thermally broken; framing members are composite assemblies of two separate extruded-aluminum components permanently bonded by a material of low thermal conductance.

C. Exposed Flashing and Closures: Manufacturer's standard aluminum components not less than 0.040 inch thick.

D. Framing Gaskets: Manufacturer's standard.

E. Framing Sealants: As recommended in writing by manufacturer.

F. Anchors, Fasteners, and Accessories: Manufacturer's standard, corrosion-resistant, non-staining, and nonbleeding; compatible with adjacent materials.
   1. At closures, retaining caps, or battens, use ASTM A 193/A 193M, 300 series stainless-steel screws.
   2. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
   3. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended in writing by manufacturer.

G. Framing System Fabrication:
   1. Fabricate components before finishing.
   2. Fabricate components that, when assembled, have the following characteristics:
      a. Profiles that are sharp, straight, and free of defects or deformations.
      b. Accurately fitted joints with ends coped or mitered.
c. Internal guttering systems or other means to drain water passing joints, condensation occurring within components, and moisture migrating within assembly to exterior.

3. Fabricate sill closures with weep holes and for installation as continuous component.

4. Reinforce components as required to receive fastener threads.

2.03 STRUCTURED POLYCARBONATE PANELS

A. General: Translucent, extruded-polycarbonate sheet with cellular cross section that provides isolated airspaces and that is coextruded with a UV-protective layer.

1. Plastic Self-Ignition Temperature: 980 deg F or more per ASTM D 1929.

2. Burning Extent: 1 inch (25 mm) or less per ASTM D 635.

3. Burning Rate: 2.5 in./min. (1.06 mm/s) or less per ASTM D 635.

4. Smoke-Developed Index: 450 or less per ASTM E 84, or 75 or less per ASTM D 2843.

5. Flame-Spread Index: Not more than 25 per ASTM E 84.

B. Panel U-Factor: Not more than 0.28, measured in Btu/sq. ft. x h x deg F according to ASTM C 1363 and using procedures described in ASTM C 1199 and ASTM E 1423.

C. Color Stability: Not more than 3.0 units Delta E when measured according to ASTM D 2244 after outdoor weathering according to procedures in ASTM D 1435.

1. Outdoor Weathering Conditions: 60 months in Arizona or 120 months in a moderate North American climate.

D. Impact Resistance: No failure at impact of 200 ft. x lbf (271 J) according to free-falling-ball impact test using a 3-1/2-inch- (89-mm-) diameter, 6.3-lb (2.9-kg) ball.

2.04 ACCESSORY MATERIALS

A. Insulating Materials: Specified in Division 07 Section "Thermal Insulation."

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

2.05 ALUMINUM FINISHES

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

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General:
   1. Comply with manufacturer's written instructions.
   2. Do not install damaged components.
   3. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
   4. Rigidly secure nonmovement joints.
   5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
   6. Seal joints watertight, unless otherwise indicated.

B. Metal Protection: Where aluminum components will contact dissimilar materials, protect against galvanic action by painting contact surfaces with bituminous paint or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose.

C. Install continuous aluminum sill closures with weatherproof expansion joints and locked and sealed or welded corners. Locate weep holes at rafters.

D. Install components to drain water passing joints, condensation occurring within aluminum members, and moisture migrating within assembly to exterior.

E. Install components plumb and true in alignment with established lines and elevations.

F. Install insulation materials as specified in Division 07 Section "Thermal Insulation."

G. Erection Tolerances: Install assemblies to comply with the following maximum tolerances:
   1. Alignment: Limit offset from true alignment to 1/32 inch (0.8 mm) where surfaces abut in line, edge to edge, at corners, or where a reveal or protruding element separates aligned surfaces by less than 3 inches (76 mm); otherwise, limit offset to 1/8 inch (3.2 mm).
   2. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3.2 mm in 3.7 m); 1/2 inch (13 mm) over total length.

END OF SECTION
SECTION 085113

ALUMINUM WINDOWS

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Joint Sealers: Section 079200.

B. Glass and Glazing: Section 088100.

1.02 REFERENCES

A. AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights; jointly published by the American Architectural Manufacturers Association (AAMA), the Window & Door Manufacturers Association (WDMA), and the Canadian Standards Association (CSA).

B. SMA 1004, Specifications for Aluminum Tubular Frame Screens for Windows; published by the Screen Manufacturers Association (SMA).

1.03 DEFINITIONS

A. Performance class designations according to AAMA/WDMA/CSA101/1.S.2/NAFS:
   1. AW: Architectural.

B. Performance grade number according to AAMA/WDMA/CSA 101/1.S.2/A440/NAFS:
   1. Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.

C. Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.

D. Minimum Test Size: Smallest size permitted for performance class (gateway test size). Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

1.04 PERFORMANCE REQUIREMENTS

A. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer’s windows that are representative of those specified.

B. Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for Project that pass AAMA/WDMA 101/1S.2/NAFS, Uniform Load Structural Test

1. Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour at 33 feet above grade, according to ASCE 7-02, Section 6.5, “Method 2-Analytical Procedure” based on mean roof heights above grade indicated on Drawings.

2. Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch, whichever is less, at design pressure based on testing performed in accordance with ASTM E330 for both positive and negative pressure as defined by AAMA/WDMA/CSA 101/1S.2/A440;Uniform Load Deflection Test or Uniform Load Structural Test.

C. Windborne-Debris Resistance: Provide glazed windows capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed windows identical to those specified, according to ASTM E 1886 and testing information in ASTM E 1996 or AAMA 506.

D. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 degrees F, ambient.

1.05 SUBMITTALS

A. Shop Drawings: Show fabrication details and connections to adjacent construction.

B. Product Data: Catalog sheets, specifications, and installation instructions for each type window unit.

C. Samples:
   1. Corner section of frame, sash, and insect screen.
   2. Color Samples: Manufacturer’s standard color finishes.

D. Quality Control Submittals:
   1. Installer’s Qualifications Data:
a. Name of each person who will be performing the Work and their employer’s name, business address and telephone number.
b. Names and addresses of 3 similar projects that each person has worked on during the past 5 years.

1.06 QUALITY ASSURANCE

A. Certification: Each window unit shall bear the AAMA or WDMA Certification label.

B. Qualifications: The person(s) installing the windows and their Supervisor shall be personally experienced in window installations and shall have been regularly employed by a Company installing windows for a minimum of 5 years.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver windows in protective containers, marked with identification for window location.

B. Store and handle windows in a manner that will not cause damage to the finish.

PART 2 PRODUCTS

2.01 ALUMINUM WINDOW TYPES/GRADE/PERFORMANCE CLASS

A. Comply with the AAMA/WDMA/CSA 101/1.S.2/A440, NAFS requirements for the following window designation(s):
   1. Performance Class and Grade: AW40.

B. Basis-of-Design Product:
   1. Kawneer Company, Inc.
   2. NX-350 Series Thermal Windows
      a. Overlap Project Out
      b. Outswing Casement Window
      c. Fixed Window

C. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 45.

D. Thermal Transmittance: Provide aluminum windows with a whole-window, U-factor maximum indicated at 15-mph exterior wind velocity and winter condition temperatures when tested according to AAMA 1503.
   1. U-Factor: 0.36 Btu/sq. ft. x h x degree F or less.

E. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC maximum of 0.40, determined according to NFRC 200 procedures.
F. Sound Transmission Class (STC): Provide glazed windows rated for not less than 30 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.

2.02 MATERIALS

A. Frame and Sash Members: Extruded Aluminum, 6063 alloy T5 temper.

B. Fasteners: Aluminum or Stainless steel.
1. Exposed Fasteners: Phillips flat-head screws. Match the finish of the member being fastened.

C. Compression Weatherstripping:
2. PVC Gaskets: ASTM D 2287.
3. Expanded Neoprene Gaskets: ASTM C 509

D. Thermal Break: Provide manufacturer’s standard continuous thermal barrier.

E. Insect Screens: Manufacturer’s standard removable unit for each operable sash, designed not to interfere with sash operation.
1. Frame: Extruded or formed aluminum 0.040 inch minimum wall thickness, mitered or coped joints, concealed mechanical fasteners.
2. Retainer Spline: Vinyl.
3. Screen Mesh: Manufacturer’s standard or recommended screen.

F. Bituminous Coating: Cold-applied asphalt mastic complying with SSPC-PAINT 12, compounded for 30-mil thickness per coat.

2.03 FINISHES

A. Prepare the aluminum surfaces for finishing in accordance with the Aluminum Association recommendations and standards.

B. Finish all exposed aluminum surfaces. Process all components of each assembly simultaneously to attain uniform color.

C. Finish: Natural Anodized, NAAMM AA-M21C22A41, (minimum thickness 0.7 mils), natural aluminum color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine surfaces to receive aluminum windows for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.
3.02 INSTALLATION
   A. Install the Work of this Section in accordance with the manufacturer’s printed
      instructions, except as shown or specified otherwise.
   B. Paint aluminum surfaces in contact with masonry or incompatible metals with
      bituminous coating.
   C. Anchor window units securely in place, plumb, level, aligned, without warp of
      frames or sash.

3.03 ADJUSTING
   A. Adjust operating sash and hardware for smooth operation and weathertight
      closure. Lubricate hardware and other moving parts, except parts in contact with
      weatherstripping.

3.04 CLEANING
   A. Clean aluminum surfaces promptly after installation.

END OF SECTION
SECTION 087100
FINISH HARDWARE

PART 1  GENERAL

1.01  RELATED WORK IN OTHER SECTIONS

A.  Section 081102 – Steel Doors and Frames.

B.  Section 081613 – Fiberglass Doors.

C.  Section 083323 – Rolling Doors.

D.  Section 083325 – Composite Sectional Overhead Doors.

E.  Section 084313 – Aluminum Framed Storefronts.

1.02  REFERENCES


F.  ANSI/BHMA Standard A156.4 Door Controls – Closers (2008).


O.  DHI - Door and Hardware Institute.
P. NAAM Standard HMMA 800-96- Hollow Metal Manufacturers Association.

Q. NAAM Standard HMMA 831-97 Recommended Hardware Locations for Custom Hollow Metal Doors and Frames.

R. 2010 Standards for State and Local Government Facilities: Title II.

1.03 DEFINITIONS

A. Architectural Hardware Consultant (AHC): A Door and Hardware Institute certified expert in complex architectural openings requiring advanced knowledge of model building codes and safety standards, ADA requirements, access control knowledge and installation expertise.

B. Architectural Hardware Distributor: A company that regularly purchases architectural hardware from manufacturers and specializes in the sale, service and support of that hardware to contractors and/or end users.

C. Company Field Advisor(s): Hardware manufacturers’ representatives who are certified in writing by manufacturer to be technically qualified in design, installation, and servicing of products.

D. Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in finish hardware installation, and is qualified and responsible to ensure approved finish hardware is installed, adjusted, and operates properly.

E. Benchmark: Finish hardware installed on full size door and frame assembly that is constructed on-site. Benchmarks are constructed to verify qualities of materials and execution; to review coordination between frames, doors, and architectural hardware; to show interface between partitions and frames; and to demonstrate compliance with specified installation tolerances. Benchmarks are not samples. Unless otherwise indicated, approved benchmarks establish the standard by which the Work will be judged. The approved benchmark may be incorporated into the work of this section.

1.04 SUBMITTALS

A. Waiver of Submittals: The Waiver of Certain Submittal Requirements in Section 013300 does not apply to this Section.

B. Re-Evaluation Fee: In accordance with the General Conditions 07213 Article 4.7.

C. Submittal Package Cover Sheets: The Hardware Distributor shall provide a cover sheet, which identifies each package by:
   1. OGS project number.
   2. Project name.
   3. Facility name and location.
4. Submittal Package name.
5. Specification section name and number.
6. Construction Contractor’s company name, address, e-mail address, and telephone number.
7. Finish Hardware Distributor’s company name, address, e-mail address, and telephone number.
8. Certified Architectural Hardware Consultant’s name, company name, address, e-mail address, and telephone number.
9. Submittal Date.

D. Submittal Packages
1. Quality Control Package: Do not submit balance of packages until this package is approved.
   a. Architectural Hardware Consultant Data:
      1) Provide name, business address, and telephone number of DHI certified Architectural Hardware Consultant.
      2) Submit photocopy of Door and Hardware Institute’s certificate demonstrating individual is an Architectural Hardware Consultant.
   b. Company Field Advisor Data:
      1) Provide name, business address, and telephone number of Company Field Advisor(s) for continuous hinges, door bolts, locksets, overhead stops, door closers, and gaskets.
      2) List services and products for which company field advisor(s) is/are certified by manufacturer. Provide written certifications.
   c. Hardware Distributor’s Qualification Data:
      1) Provide the Finish Hardware Distributor’s company name, address, e-mail address, and telephone number.
      2) Provide the hardware distributor’s company history, including number of years in the hardware distribution business, the number of AHC’s employed, and the number of employees. Describe the distributor’s major market.
      3) Include the names and contact information of physical plant managers for 3 facilities, similar to this project, for which the distributor has furnished architectural hardware within the past 2 years.
   d. Supervisor’s/Installer’s Qualification Data:
      1) Name of Supervisor and each installer performing Work, and employer’s name, business address and telephone number.
      2) Names and addresses, and contact information of physical plant managers for 3 facilities, similar to this project, on which each installer has worked on during past 2 years.
2. Finish Hardware Package:
   a. Finish Hardware Schedule: Use vertical format and indicate finish hardware items, both mechanical and electrical in one document, required to complete Work of this section. Submit Hardware Schedule that includes complete hardware sets for each door and frame shown on Door Schedule.
      1) Preface schedule with following:
         a) Certified Architectural Hardware Consultant’s statement of preparation of/or certification of, Finish Hardware Schedule.
         b) Index.
         c) List of manufacturers.
         d) List of finishes.
         e) Explanation of abbreviations.
         f) Keying instructions and key schedule.
      2) Create hardware groups, each group consisting of similar doors and hardware. Do not combine labeled and non-labeled openings. Do not combine doors and frames with dissimilar door sizes and/or materials.
      3) For each opening include the following:
         a) Door and frame materials and dimensions.
         b) Fire rating.
         c) Door number, location and handing.
         d) Degree of opening required for closer and/or overhead stop.
         e) Installation and detailing notes.
      4) Under each group heading, list hardware items in detail, required for ordering. For each hardware item include:
         a) Type (Hinges).
         b) Quantity (Hinges 3ea).
         c) Manufacturers’ name (Hinges 3ea Stanley).
         d) Catalog number (Hinges 3ea Stanley FBB199).
         e) Size (Hinges 3ea Stanley FBB199 4 ½ x 4 ½ ).
         f) Options or accessories (Hinges HTFBB199 4 ½ x 4 ½ ).
         g) Finish (Hinges HTFBB199 4 ½ x 4 ½ x 630).
         h) Fasteners (Hinges HTFBB199 4 ½ x 4 ½ x 630 x torx with center security pin).
         i) Indicate location of protection plates: Push side or pull side.
         j) Installation Notes, as written in this section, for each hardware group.
      5) Use a separate hardware group in Hardware Schedule that lists attic stock hardware items, key cabinets, key control system, special tools required to install hardware, lubricants, and Operations and Maintenance Manuals.
   b. Product Data: Furnish six copies of manufacturers’ catalog sheets, specifications, sizing charts, and installation instructions, for each item specified. Highlight information pertaining specifically to product (s) submitted.
   c. Submit samples as requested.
3. Closeout Submittals Package: Submit as a complete package.
   a. Operation and Maintenance Manuals: Furnish 2 hardcover three-
      ring binders with the project name and number displayed on the
      front cover and spine. Include:
      1) List of Manufacturers.
      2) Approved Finish Hardware Schedule.
      3) Approved Manufacturers’ Product Data Sheets.
      4) Manufacturer’s operation, installation, maintenance, and
         repair instructions for each type of hardware furnished.
      5) Templates for kind of hardware furnished.
      6) Parts List for each type of finish hardware furnished.
      7) Manufacturers’ dated written warranty for each type of
         finish hardware furnished.
      8) Certifications: Written certification from Company Field
         Advisors that their products are installed according to
         manufacturers’ printed installation instructions, are
         operating properly, and manufacturers’ written warranty will
         be in effect upon physical completion of the Work.
      9) Special Tools: List of special tools required to install
         hardware, and their purpose.
   b. Special Tools:
      1) At conclusion of finish hardware installation, turn over
         to Director’s Representative 2 of each special tool
         required to install hardware together with a list of these
         tools and their purpose.

1.05 TEMPLATES

   A. After receipt of approved submittals, furnish templates to affected trades, to
      enable fabricators to make provision for finish hardware without delaying the
      Work of the Project.

1.06 DELIVERY AND STORAGE

   A. Coordinate delivery to avoid delay.

   B. Clearly label each item for identification and installation location as it
      corresponds to the approved Finish Hardware Schedule and subsequent
      information bulletins.

   C. Deliver hardware to the jobsite in the manufacturers’ original packages complete
      with fasteners, parts, installation instructions, and templates required for proper
      installation.

   D. Inventory hardware at jobsite to identify shortages or backorders. Resolve
      delivery shortages and damaged items prior to installing hardware.

   E. Store finish hardware where directed by Director’s Representative. Provide
      locked, dry storage for finish hardware.
1.07 QUALITY ASSURANCE

A. Hardware Distributor’s Qualification:
1. Hardware Distributor who has been in the business of furnishing, and/ or installing finish hardware for a minimum of three years.
2. Hardware Distributor shall have the DHI certified Architectural Hardware Consultant prepare or certify the Finish Hardware Submittal meets specification requirements, and the schedule is written accurately and in accordance with DHI recommendations, and requirements of this specification.

B. Company Field Advisors: Employ advisor(s) for continuous hinges, door bolts, mortise locksets, surface overhead stops, door closers, and gaskets.

C. Installation Supervisor: Employ a qualified Installation Supervisor who will be responsible to ensure approved finished hardware is installed, adjusted and operates properly.

D. Installers: Employ experienced finish hardware installers who have been regularly employed by a Company installing finish hardware for a minimum of 5 years.

E. Pre-submittal Conference: Before Finish Hardware Submittals are written for submission, the Director’s Representative will call a teleconference to review Finish Hardware Submittal requirements including but not limited to format, cover sheet, headings, hardware sets, level of detail, installation notes, description of operation, keying, and product data sheets. The Contractor, the Finish Hardware Distributor, the Finish Hardware Detailer, and consulting hardware designer, and OGS Designers shall attend. The OGS Finish Hardware Reviewer shall conduct the conference.

F. On Site Pre-installation Conference: Before finish hardware installation begins, the Director’s Representative will call a conference at the site to review Finish Hardware Specifications, approved Finish Hardware Submittals, and to discuss requirements for the Work including:
1. Hardware delivery and storage.
2. Hardware labeling by door number.
3. Hardware locations.
4. Potential location conflicts.
5. Hardware installation sequence and responsibility.
6. Required accessories and fasteners.
7. Continuous hinge installation.
8. Surface overhead stops and closer template and adjustments.
9. Special tools and maintenance items.
10. Hardware Closeout requirements.
11. Hardware Warranties.
G. Pre-installation Conference Attendance: The Construction Contractor, Company Field Advisors, authorized Finish Hardware Installers, and the Finish Hardware Distributor’s Architectural Hardware Consultant shall attend the conference. OGS’s Finish Hardware Reviewer conducts the meeting. OGS designers and facility personnel may attend. The Company Field Advisors will present installation instruction and advice.

H. Pre-Benchmark-Construction Meeting: Prior to the construction of the mock-up, a meeting will be held at the site to review the requirements, and discuss the intent of the mock-up. The meeting will be scheduled by the Director’s Representative and conducted by the Hardware Designer. The meeting shall be attended by the Director’s Representative, the Hardware Designer, the Contractor’s onsite foreman, the person supervising this phase of the Work (if different), and the person (people) who will be performing the work.

I. Construction of Benchmark: Before installing portions of the Work requiring benchmarks, install benchmarks for each form of construction required to comply with the following requirements, using materials indicated for the completed Work.
   1. Build hardware benchmark in door and frame assembly, specified in section 081102, in locations as directed, and include continuous hinge, lockset, closer, surface overhead stop and gaskets.
   2. Notify the Director’s Representative in advance of dates and times when benchmark will be constructed.
   3. Install benchmark with supervisor oversight and workers who will be employed during the construction of the Work.
   4. Construct benchmarks using the exact materials, products, methods, and workmanship that were approved for the Work.
   5. Obtain Director’s Representative’s approval of benchmarks before starting work, fabrication, or construction.
   6. Maintain benchmarks during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Failure to maintain this standard of quality will be cause for rejection of the Work.
   8. Benchmark may be used in the Work unless otherwise indicated.

J. Uniformity of Hardware and Single Source Responsibility: For each kind of hardware provide product(s) of a single manufacturer.

K. Size Variations: Manufacturers’ products may vary slightly from sizes specified except where minimum size or thickness is specified.

1.08 WARRANTY

A. Manufacturer’s Warranty: Ten year minimum warranty for door closers.

B. Manufacturer’s Warranty: Three year minimum for locksets.
1.09 MAINTENANCE

A. Special Tools: At the conclusion of finish hardware installation, turn over to Owner’s Representative 2 sets of each special tools required for proper installation and adjustment of hardware, together with a list of these tools and their purpose.

B. Lubricants: Provide manufacturer’s recommended lubricants for locksets and closers sufficient for 1 year of maintenance. Turn over to Director’s Representative.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Provide brackets, plates, arms, spacers, and special templates to mount door closers in combination with overhead stops and coordinators, on narrow top rails and for special ceiling and jamb conditions.

B. Provide curved lip strikes, with wrought boxes, specific to individual lock functions. Universal strikes that fit a variety of lock functions are not acceptable.

2.02 FASTENINGS

A. Provide fasteners that harmonize with finish hardware material and finish.

B. Provide machine screws for hardware secured to metal; and machine screws and metal expansion shields for attachment to masonry substrates. Self-tapping or self-drilling screws are not acceptable.

C. Provide undercut shallow head torx center pin security fasteners where necessary for proper seating.

D. Attach door closers and overhead stops with sex bolts.

2.03 MATERIALS AND FINISHES

A. General: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in this section and in the Hardware Groups.

B. Continuous Hinges
   1. Full height barrel-type manufactured from 14-gauge 304 stainless steel.
   2. .25” diameter stainless steel pins.
   3. Provide hinges without covers.

C. Locks, Latches and Bolts
   1. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
2. Provide 3/4” minimum throw on other latch bolts.
3. Provide 1” minimum throw deadbolts.

D. Closers and Door Control Devices
1. Closer bodies: Provide closer bodies with the same hole template pattern regardless of type or application.
4. Provide all-weather fluid to eliminate seasonal adjustment of closer speed.
5. Powder coat closer body, arm, and adapter plate or pre-treat closer body, arm, and adapter plate with rust-inhibiting coating before painted finish is applied.

2.04 FINISH HARDWARE

A. Hardware Sets:

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### Hardware Set No. 16

**DESCRIPTION OF OPERATION**

**Normal Operation:** Doors are normally closed and locked by fail secure mortised electric lock on active leaf and automatic flushbolts on inactive leaf. Electric wire thru monitor hinge conducts power to electric lock and indicates door open/door closed. Lockset’s outside trim is unlocked when power is applied and locked when power is removed. Upon authorization by Card reader, outside lever is unlocked and rotating lever retracts latchbolt for entry. Inside lever is always free for egress and contains a switch (REX) which monitors activation of the inside trim, and sends a signal to power the magnetic locks and interlock the designated doors when one door is opened. The electric mortise lock contains latchbolt monitoring for full extension of main latch and auxiliary monitoring for solenoid status (locked/unlocked) and deadlatch position.
Interlock: Doors are electrically interlocked by magnetic locks so that only one opening can be unlocked from the locked closed position at any time. Refer to the Interlocked Door Schedule on the Contract Drawings for requirements.

Emergency Operation: Doors are normally closed and locked by fail secure mortised electric lock and automatic flushbolts. In the event of power failure or fire alarm activation outside lever trim remains locked. Free egress at all times. Pulling emergency release station adjacent to opening releases that opening’s electromagnetic lockets if electromagnetic locksets are energized (locked).

Installation Note: Install electric hinges and junction boxes in middle hinge position

B. Group 4: Furnish a quantity of 1 (one) as follows:
   1. 50 Key Blanks to match existing key system.
   2. 1 set Special Tools: See paragraph 1.09 A.
   3. Lubricants: See paragraph 1.09 B.
   4. 2ea Maintenance and Operations Manuals.

2.05 KEYING

A. Continue NYS Department of Transportation, Best Lock, key system established for Facility.
   1. Stamp key symbol on one side of key, and “Do Not Duplicate” on other side of key.
   3. Furnish one copy of factory bitting list to facility.
   4. Factory key cylinders.
   5. Furnish 3 cut keys for each master key.
   6. Furnish 7 cut keys for each keyed lockset.
   7. These cut key quantities are for bidding purposes only. Actual number of cut keys required will be determined at keying meeting.
   8. When lockset and cylinder are by different manufacturers, identify and furnish correct cylinder cam to operate lockset.
   9. Provide compression rings and spacers to achieve proper spacing relationship between cylinder and face of door.

B. Keying Conference
   1. Immediately following contract award, Director’s Representative will schedule a keying conference to develop a written key schedule that reflects Facility’s specific keying requirements. Facility Representative(s), Hardware Distributor, Consulting Hardware Designer, and OGS’s Hardware Designer will attend.
   2. Incorporate this schedule in Finish Hardware Submittals for approval.
PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and frames and related items for conditions such as, but not limited to, incorrect handing, hardware preparation, misaligned lock and strike preparations, that would prevent proper application of finish hardware. Do not proceed until defects are corrected.

B. Report conditions or hardware applications that are incorrect to the Director’s Representative.

3.02 INSTALLATION

A. Do not proceed with installation of finish hardware prior to attending referenced pre-installation conference.

B. Installation Sequence: Use proper installation sequence, i.e., install coordinators, and overhead stops and holders before surface mounted door closers.

C. Install hardware in accordance with manufacturer’s printed installation instructions, and adjust for smooth operation, free of sticking, binding or rattling.
   1. Template surface overhead stops and holders for proper operation
   2. Template and adjust closers for proper operation.

D. Use proper tools and methods to prevent scratches, burrs or other defacement.

E. Threshold Installation:
   1. Drill holes 3 inches from each end of threshold and intermediate holes 12 inches maximum o.c. for required fasteners. Prepare holes for countersunk fasteners.
   2. Level and align thresholds with frames and doors. Where required, use non-corrosive shims.
   3. Exterior Doors: Set thresholds in a solid bed of Type 3 sealant.
   4. Secure thresholds to substrate with countersunk fasteners.

F. Door Bottom Installation:
   1. Mount sweep type door bottom protection/drip caps on exterior side of doors.
   2. Before mounting apply Type 2 sealant on the back side of bearing surface. Secure to door with required fasteners.

G. Gasket Installation:
   1. Install continuous stripping at each opening without unnecessary interruptions.
   2. Where fasteners are required, secure fasteners for stripping and seals so they will not work loose during door operation. Exposed heads of fasteners shall be free of sharp edges.
   3. Coordinate meeting stile gasket with hardware before installation.
4. Install units plumb and level at the optimum location to maintain a permanent effective seal.

H. After installation, cover and protect hardware to prevent damage during remaining construction. Remove protection upon completion of construction.

3.03 LOCATIONS

A. Locate hardware as follows:
   1. Door Closers: Template for maximum door swing allowed by wall placement and jamb conditions. Where overhead stop prevents door from swinging to wall, template the closer to exceed degree of opening allowed by overhead stop.
   2. Protection Plates: 1/8 inch from door bottom.
   3. Wall Stops: Centerline of bumper to match centerline of locking trim.

3.04 FIELD QUALITY CONTROL

A. Post Installation Review: After hardware is adjusted for proper operation, Director’s Representative will hold a Post-Installation Review with the Contractor, Hardware Designer, Company Field Advisors, Hardware Distributor and Hardware Installers.
   1. Physically inspect to verify proper application, installation, adjustment and operation of finish hardware, and in particular that:
      a) Latches engage freely without binding. Filing of strike plates to relieve latch bind is not acceptable.
      b) Closers are adjusted for proper spring power; sweep speed, latching speed; and hydraulic back check.
      c) Locations and proper attachment of installed protective hardware are as specified.
      d) There is no field modification of fasteners.
      e) Damaged fasteners are replaced.
   2. Defective hardware is repaired or replaced.
   3. Hardware is to be left clean and free from disfigurement.

B. Turn referenced Operations and Maintenance Manuals over to Facility through Director’s Representative.

END OF SECTION
SECTION 088100
GLASS AND GLAZING

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Plastic Sheet Glazing: Section 088400.

1.02 REFERENCES

A. Comply with recommendations in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown or specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

1.03 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions for each type of glass and glazing material specified, and spacers and compressible filler rod.

B. Samples:
   1. Glass: 12 x 12 inch pieces for each type of glass specified.  
      a. Insulating glass samples need not be hermetically sealed, but include edge construction materials.
   2. Setting blocks, full size.
   3. Color Samples for Glazing Materials: Manufacturer's standard colors.  
      a. Marking Decals: Manufacturer's standard colors.

C. Quality Control Submittals:
   1. Certificates:  
      a. Affidavit required under Quality Assurance Article.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Compatibility of Materials: All components of the glazing system shall be manufactured or recommended by one manufacturer to assure the compatibility of materials.

C. Safety Glazing Material: Type indicated, meeting requirements of ANSI Z97.1 with label on each piece.
D. Certification:
   1. Affidavit by the material supplier, certifying type and quality of glass furnished.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect glass from edge damage during handling, storage, and installation.

1.06 PROJECT CONDITIONS

A. Environmental Requirements: Comply with glazing materials manufacturer's written recommendations regarding environmental conditions under which glazing materials can be installed.

B. Glazing channel dimensions shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate glazing material thicknesses, with reasonable tolerances. Provide correct glass size for each opening, within the tolerances and necessary dimensions required.

PART 2 PRODUCTS

2.01 GLASS

A. Type A Glass: Transparent Float Glass; ASTM C 1036, Type I, Class 1, quality q3.
   1. Thickness: 1/4 inch.

B. Type D Glass: Tempered Float Glass; ASTM C 1048, Kind FT, Condition A, Type I, Class 1, tempered by the manufacturer's standard process (after cutting to final size).
   1. Thickness: 1/4 inch.

C. Type G Glass: Clear Fire-Rated Glass (No Wire): Fire Lite distributed by Technical Glass Products, 5525 Lake View Dr., Kirkland, WA 98033.
   1. Surface Condition: Premium (polished surfaces).
   2. Classification Mark Location: Lower right corner.

D. Type M Glass: Organically Sealed Insulating Glass Units; ASTM C 1048, applicable Type and Class for glass indicated below, quality q3 for Type I glass; manufacturer's standard edge construction of spacers and sealants permanently bonded to glass surfaces and hermetically sealed to provide a dehydrated air space 1/2 inch thick with -60 degrees F. dew point; fabricated of the following glass.
   1. Exterior Glass: Tempered Glass
      a. Low-e coating, Sputter-coating (vacuum deposition process) on second surface
   2. Interior Glass: Tempered Glass
2.02 GLAZING MATERIALS

A. Type 5 Glazing Material: Butyl Rubber Glazing Sealant; polymerized butyl rubber compound with inert fillers and pigments; FS TT-S-001657, Type I; solvent-based with 75 percent solids, non-sag, tack-free within 24 hours, paintable, non-staining.

B. Colors: For exposed materials provide color as indicated or, if not indicated, as selected by the Director from the manufacturer's standard colors. For concealed materials, provide any of the manufacturer's standard colors.

C. Setting Blocks: Neoprene, 70-90 durometer hardness, with proven compatibility with sealants used.

D. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with glazing materials used.

E. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

F. Cleaners, Primers and Sealers: Type recommended by glazing material manufacturer.

2.03 MISCELLANEOUS

A. Safety Marking Decals: Opaque decals, 4 inch diameter, color as selected by the Director from manufacturer's standard colors.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.

B. Inspect each piece of glass immediately before installation, and eliminate pieces which have observable damage or face imperfections.

C. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.02 INSTALLATION

A. Each installation shall withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors) without failure of any kind.
including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.

B. Install glass in accordance with the standards detailed in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

C. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.

D. Install glazing materials in accordance with the manufacturer's printed instructions.

3.03 GLAZING

A. Install setting blocks of proper size at quarter points of sill rabbet. If required to keep in place set blocks in thin course of the heel-bead compound.

B. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light sizes, thickness and type of glass, and complying with manufacturer's recommendations.

D. Do not cut, seam, nip, or abrade glass which is tempered, heat strengthened, or coated.

E. Force glazing materials into channel to eliminate voids and to ensure complete "wetting" or bond of glazing material to glass and channel surfaces.

F. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

G. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.
H. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

3.04 CURE, PROTECTION AND CLEANING

A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.

B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

C. Replace glass included in the work which is broken, or otherwise damaged, from the time Work is started at the site until the date of physical completion.

D. Maintain glass in a reasonably clean condition until date of physical completion.
   1. Clean and trim excess glazing material from the glass and stops or frames promptly after installation.

E. When directed, or just before the project is turned over to the State, remove dirt and other foreign material and wash and polish glass included in the work on both sides.

3.05 MARKING DECALS

A. Install two marking decals on each transparent glass door, and on each transparent glass sidelight which is wider than 20 inch between stiles. Locate decals midway between stiles 34 inch and 64 inch above the floorline.

END OF SECTION
SECTION 088400

PLASTIC GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes
   1. Multiwalled structured polycarbonate glazing.

B. Related Sections:
   1. Division 08 Section "Structured-Polycarbonate-Panel Assemblies" for aluminum-framed assemblies glazed with multiwalled structured polycarbonate panels.
   2. Division 08 Sections “Metal Framed Skylights” for metal skylight units glazed with multiwalled structured polycarbonate panels.

1.03 PERFORMANCE REQUIREMENTS

A. Provide plastic glazing sheets and glazing materials capable of withstanding normal temperature changes, wind, and impact loads without failure, including loss or breakage of plastic sheets attributable to the following: failure of sealants or gaskets to remain watertight and airtight, deterioration of plastic sheet and glazing materials, or other defects in materials and installation.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on plastic glazing and glazing framing members.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.04 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Product Data: Catalog sheets, specifications, and installation instructions for plastic glazing. Include tables indicating the following information for sash size required:
   1. Sheet thickness.
   3. Minimum rabbet depth.
   5. Minimum sealer tape thickness.
C. Samples:
1. Acrylic Sheet: 12 by 12 inch pieces.
2. Polycarbonate Sheet: 12 by 12 inch pieces.

D. Product Data: For each type of product indicated.

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

F. Glazing Accessory Samples: For gaskets and sealants, in 12-inch (300-mm) lengths.

Plastic Glazing Schedule: List plastic glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of plastic glazing and construction that receives plastic glazing, including clearances and glazing channel dimensions.

G. Product Certificates: For plastic glazing and glazing products, from manufacturer.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for plastic glazing, glazing sealants, and glazing gaskets.
1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

I. Preconstruction adhesion and compatibility test report.

J. Research/Evaluation Reports: For plastic glazing.

K. Contract Closeout Submittal:
1. Maintenance Data: Deliver two copies, covering the installed products, to the Director’s Representative.
2. Warranty: Copy of specified warranty.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Unless otherwise specified, comply with the following:
2. Polycarbonate Sheet: Underwriters’ Laboratories listed “Burglary-Resistant”.

B. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

C. Source Limitations: Obtain plastic glazing from single source from single manufacturer. Obtain sealants and gaskets from single source from single manufacturer for each product and installation method.

D. Glazing Publication: Comply with published recommendations of plastic glazing manufacturers and with GANA’s "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glazing terms not otherwise defined in this Section or in other referenced standards.
E. Plastic Glazing Labeling: Identify plastic sheets with appropriate markings of applicable testing and inspecting agency, indicating compliance with required fire-test-response characteristics.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store plastic sheets with protective masking intact.

B. Deliver and store glazing materials in original, unopened containers bearing manufacturer’s labels. Protect plastic glazing materials according to manufacturer's written instructions. Prevent damage to plastic glazing and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

C. Handle plastic sheets with care. Avoid scratching or marring surfaces. Maintain protective coverings on plastic glazing to avoid exposures to abrasive substances, excessive heat, and other sources of possible deterioration.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
   1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.08 COORDINATION

A. Coordinate dimensions of plastic glazing with dimensions of construction that receives plastic glazing to ensure that glazing channels provide adequate face and edge clearance, bite, and allowance for expansion.

1.09 WARRANTY

A. Manufacturer's Special Warranty for Abrasion- and UV-Resistant, Multiwalled Structured Polycarbonate: Manufacturer's standard form, made out to Owner and signed by polycarbonate manufacturer, in which manufacturer agrees to replace polycarbonate products that break or develop defects from normal use that are attributable to manufacturing process and not to practices for maintaining and cleaning plastic glazing contrary to manufacturer's written instructions. Defects include coating delamination, haze, excessive yellowing, and loss of light transmission beyond the limits stated in plastic glazing manufacturer's standard form.
   1. Warranty Period: Five years from date of Substantial Completion.
PART 2 - PRODUCTS

2.01 PLASTIC GLAZING, GENERAL

A. Sizes: Fabricate plastic glazing to sizes required for openings indicated. Allow for thermal expansion and contraction of plastic glazing without restraint and without withdrawal of edges from frames, with edge clearances and tolerances complying with plastic glazing manufacturer's written instructions.

B. Fire-Test-Response Characteristics of Plastic Glazing: As determined by testing plastic glazing by a qualified testing agency acceptable to authorities having jurisdiction.
   1. Self-ignition temperature of 650 deg F (343 deg C) or higher when tested according to ASTM D 1929 on plastic sheets in thicknesses indicated for the Work.
   2. Smoke-developed index of 450 or less when tested according to ASTM E 84, or smoke density of 75 or less when tested according to ASTM D 2843 on plastic sheets in thicknesses indicated for the Work.
   3. Burning extent of 1 inch (25 mm) or less when tested according to ASTM D 635 at a nominal thickness of 0.060 inch (1.52 mm) or thickness indicated for the Work, meeting Class CC1.
   4. Flame-spread index not less than that indicated when tested according to ASTM E 84.

2.02 MULTIWALLED STRUCTURED POLYCARBONATE GLAZING

A. Multiwalled Structured Polycarbonate Sheet: Manufacturer's standard polycarbonate extruded shape with smooth, flat exterior surfaces and internal ribbing.
   1. Products: Subject to compliance with requirements, the following material has been established as the Basis of Design: Wasco Lumiwall Translucent Panel System. Subject to the requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Amerilux International, LLC; Coverlite Multiwall Polycarbonate.
      b. Gallina USA LLC; Policarb.
      c. Palram Americas; Sunlite SL.
      d. Gallina USA LLC; Policarb with UV protective coating on both faces.
      e. Co-Ex Corporation; Macrolux HR.
   2. Nominal Thickness: 1 inch
   3. Color: Opal IR.
   5. Flame-Spread Index: 75 or less.

2.03 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets, EPDM, ASTM C 864 or silicone, ASTM C 1115; and of profile and hardness required to maintain watertight seal.
2.04 GLAZING SEALANTS

A. General:
   1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including plastic glazing products 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. VOC Content: For sealants used inside the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   4. 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.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Dow Corning Corporation; 790.
      d. Pecora Corporation; 890.
      e. Sika Corporation, Construction Products Division; SikaSil-C990.
      f. Tremco Incorporated; Spectrem 1.

2.05 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
   1. AAMA 804.3 tape, where indicated.
   2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
   3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.06 MISCELLANEOUS GLAZING MATERIALS

A. Compatibility: Provide products of material, size, and shape complying with requirements of manufacturers of plastic glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: EPDM or silicone as required for compatibility with glazing sealant and plastic glazing, and of hardness recommended by plastic glazing manufacturer for application indicated.

D. Compressible Filler Rods: Closed cell of waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5- to 10-psi (35- to 70-kPa) compression strength for 25 percent deflection.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine plastic glazing framing, with glazing Installer present, for compliance with the following:
   1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
   2. Minimum required face or edge clearances.
   3. Effective sealing between joints of plastic glazing framing members.

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

3.02 PREPARATION

A. Clean glazing channels and other framing members immediately before glazing. Remove coatings not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.03 GLAZING, GENERAL

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

B. Glazing channel dimensions indicated on Drawings are designed to provide the necessary bite on plastic glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust plastic glazing lites during installation to ensure that bite is equal on all sides.

C. Sand or scrape cut edges of plastic glazing to provide smooth edges, free of chips and hairline cracks.

D. Remove burrs and other projections from glazing channel surfaces.

E. Protect plastic glazing surfaces from abrasion and other damage during handling and installation, according to the following requirements:
   1. Retain plastic glazing manufacturer's protective covering or protect by other methods according to plastic glazing manufacturer's written instructions.
2. Remove covering at border of each piece before glazing; remove remainder of covering immediately after installation where plastic glazing will be exposed to sunlight or where other conditions make later removal difficult.

3. Remove damaged plastic glazing sheets from Project site and legally dispose of off-site. Damaged plastic glazing sheets are those containing imperfections that, when installed, result in weakened glazing and impaired performance and appearance.

F. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

G. Install elastomeric setting blocks in sill channels, sized and located to comply with referenced glazing publication, unless otherwise instructed by plastic glazing manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

H. Provide edge blocking to comply with referenced glazing publication unless otherwise instructed by plastic glazing manufacturer.

I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

J. Square cut wedge-shaped gaskets at corners and install gaskets as recommended in writing by gasket manufacturer to prevent corners from pulling away; seal corner and butt joints with sealant recommended by gasket manufacturer.

3.04 TAPE GLAZING

A. Install tapes continuously, but not in one continuous length. Do not stretch tapes to make them fit opening.

B. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

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

D. Do not remove release paper from tape until immediately before each lite is installed.

E. Apply heel bead of glazing sealant.

F. Center plastic glazing 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.

G. Apply cap bead of glazing sealant over exposed edge of tape.
3.05  **GASKET GLAZING (DRY)**

A. Fabricate compression gaskets in lengths recommended in writing by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between plastic glazing and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Center plastic glazing 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 plastic glazing. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

3.06  **SEALANT GLAZING (WET)**

A. Install continuous spacers between plastic glazing lites and glazing stops to maintain plastic glazing face clearances and to prevent sealant from extruding into glazing channel weep systems until sealants cure. Secure spacers 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 plastic glazing and channel surfaces.

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

3.07  **PROTECTING AND CLEANING**

A. Protect plastic glazing from contact with contaminating substances from construction operations. If, despite such protection, contaminating substances do come into contact with plastic glazing, remove immediately and wash plastic glazing according to plastic glazing manufacturer's written instructions.

B. Remove and replace plastic glazing that is broken, chipped, cracked, abraded, or damaged in other ways during construction period, including natural causes, accidents, and vandalism.

C. Wash plastic glazing on both faces before date scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Wash plastic glazing according to plastic glazing manufacturer's written instructions.

**END OF SECTION**
SECTION 089100

STATIONARY METAL WALL LOUVERS

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Metal Framing and Supports: Section 055000.

B. Rough Carpentry: Section 061000.

C. Sealants: Section 079200.

1.02 SUBMITTALS

A. Shop Drawings: Show fabrication details and connections to adjacent Work.

B. Product Data: Catalog cuts, specifications, and installation instructions for louver type specified.

C. Samples: 12 x 12 inch corner section of louvers specified.

1.03 QUALITY ASSURANCE

A. Louvers shall be rated by AMCA (Air Movement and Control Assoc.).

PART 2   PRODUCTS

2.01 ALUMINUM LOUVERS

A. Type: Stationary drainable blade extruded louvers, 4 inches deep, with extrusions not less than 3 inch thick, of aluminum alloy required for the indicated finish.

1. Drainable blades formed with a drain gutter in each blade, positioned at approximately 37 degree angle and spaced approximately 4-1/2 inch centers.

2. Frames formed with downspouts in each jamb and mullion.

3. Maximum air velocity below point of zero water penetration velocity.

4. Maximum pressure drops:
   a. 0.13 inch w.c. exhaust louvers.
   b. 0.09 inch w.c. intake louvers.
B. Fabrication: Form frames with mitered or coped members, welded or riveted and soldered joints. Form ends of blades flat against frame jamb and weld, or rivet and solder blades to frame at each end to ensure watertight joints. Reinforce units with concealed plates, angles, tees or other shapes to form a rigid unit. Fabricate louvers with horizontal and vertical mullions where louver openings exceed 60 inches in any direction. Allow for expansion and contraction.

C. Finishes: Comply with the Metal Finishes Manual of the National Assoc. of Architectural Metal Manufacturers except as otherwise indicated.
1. Mill finish.
2. Clear anodized (AA-C22A41).
3. Protect exposed factory finished surfaces prior to shipping.

D. Sills: Same material and finish as the louvers.

2.02 LOUVER SCREENS

A. Fabricate removable screen frames of the same metal and finish as the louvers. Locate screens on the inside face of the louvers, unless otherwise indicated. Secure screens to louver frames with machine screws at each corner and spaced 12 inches oc.

B. Insect Screens:
1. Anodized aluminum wire, 18 x 14 mesh.

2.03 FASTENERS AND ANCHORS

A. Bolts, Nuts, Lags, Washers, Screws and Anchors: Same material as items being installed unless otherwise indicated; types, gages and lengths to suit unit installation conditions; galvanized steel, aluminum or stainless steel for exterior locations or for items anchored to exterior walls.

2.04 MISCELLANEOUS

A. Bituminous Paint: SSPC-PAINT 12 (Cold applied asphalt mastic).

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer’s printed instructions, except as shown otherwise on the Drawings.

B. Install units plumb, level and in proper alignment with adjacent construction.

C. Form tight joints with exposed connections accurately fit together.
D. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to form a weathertight connection.

E. Where louvers are in contact with concrete, masonry or a dissimilar metal, coat the contacting surface with a heavy coat of bituminous paint.

F. Clean louvers after installation. Remove dirt, dust, and grime.

END OF SECTION
1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cold Formed (Load Bearing) Metal Framing: Section 054000.
B. Non-Load Bearing Framing and Furring: Section 092213.
C. Furring for Gypsum Board Ceilings: Section 092214.

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each item specified.
B. Samples:
   1. Gypsum Board: 12 inches square, each type specified.
   2. Fasteners: 10 each type specified.
   3. Adhesive: 1 pint.

1.03 QUALITY ASSURANCE

A. Fire Resistance Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating, UL Design Number, or Gypsum Association File Number indicated.
B. Single Source Responsibility: Obtain components for gypsum board shaft-wall assemblies from a single manufacturer for each type of assembly required.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.
B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.05 PROJECT CONDITIONS

A. Environmental Requirements: Comply with gypsum board manufacturer’s printed temperature and ventilation requirements during application and finishing. Ventilate installation areas to relieve excess moisture.
PART 2  PRODUCTS

2.01  GYPSUM BOARD

A. Standard Gypsum Board:  ASTM C 1396; long edges as follows:
   1. Long Edges: Tapered.

B. Fire Resistant Gypsum Board:  ASTM C 1396; Type X, UL listed and bearing listing marking; long edges as follows:
   1. Long Edges: Tapered.

C. Moisture Resistant Gypsum Board:  ASTM C 1396; long edges tapered.

D. Moisture and Fire Resistant Gypsum Board:  ASTM C 1396; Type X, UL listed and bearing listing mark; long edges tapered.

E. Gypsum Backing Board:  ASTM C 1396; long edges square.

F. Gypsum Sheathing Board:  ASTM C 1396; long edges square.

2.02  FASTENERS

A. Steel Drill Screws:  ASTM C 1002; gypsum board manufacturer’s recommended types and sizes for substrates involved.

B. Laminating Adhesive:  Gypsum board manufacturer’s recommended type for substrates involved.

2.03  TRIM

A. Interior Trim:  ASTM C 1047.
   1. Material:  Galvanized steel or extruded vinyl.
   2. Shapes:
      a. Cornerbead:  Use at outside corners.
      b. Bullnose Bead:  Use where indicated.
      c. LC-Bead:  J-Shaped, exposed long flange receives joint compound.  Use at exposed panel edges.
      d. L-Bead:  L-shaped, exposed long leg receives joint compound with tear away bead.  Use where gypsum board abuts or intersects dissimilar material.
      e. U-Bead:  J-shaped, exposed short flange does not receive joint compound. Use where indicated.
      f. Expansion (Control) Joint:  Use where indicated.

   2. Shapes:
      a. Cornerbead:  Use at outside corners.
      b. LC-Bead:  J-shaped, exposed long flange receives joint compound.  Use at exposed panel edges.
c. Expansion (Control) Joint: One-piece, with V-shaped slot and removable strip covering slot opening.

2.04 ACCESSORIES

A. Sound Attenuation Blankets: ASTM C 665, Type 1; semi-rigid, mineral fiber blankets without membrane covering. Furnish blankets of thickness, density, and type tested by the gypsum board manufacturer for the required rating.

B. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2.05 JOINT TREATMENT MATERIALS

A. Joint Tapes: ASTM C 475; plain or perforated.

B. Joint Compound: ASTM C 475; gypsum board manufacturer’s recommended dry powder or ready-mixed, either of the following:
   1. One Compound Treatment: One compound for both bedding and finishing joints.
   2. Two Compound Treatment: Compatible joint compounds; one compound for bedding and the other compound for finishing joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates to which gypsum board system attaches or abuts, preset steel door frames, cast in anchors, and structural framing, with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of gypsum board system construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 CONSTRUCTION TOLERANCES

A. Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.

3.03 GYPSUM BOARD INSTALLATION

A. Install gypsum board in the most economical direction, of maximum lengths to minimize end butt joints. Where unavoidable, locate end butt joints as far from center of walls or ceilings as possible.
B. Install gypsum board with face side out. Butt boards together at edges and ends over firm bearing with not more than 1/16 inch of open space between boards. Do not force into place.

C. Fasteners: Fasten gypsum board to supports and furring with steel drill screws of required size and spacing as recommended by the gypsum board manufacturer.
   1. Multiple-layer Work:
      a. Mechanically fasten both layers.
      b. Stagger vertical joints in multiple layer Work. Offset joints not less than 10 inches.

D. Provide additional framing and blocking required to support gypsum board at openings and cutouts.

E. Form control joints in gypsum board where indicated. Allow 1/2 inch continuous opening between boards to allow for insertion of control joint trim.

F. Wood Supports: Provide “floating” interior angle construction between gypsum board at interior corners.

G. Reinforce joints formed by tapered edges, butt edges, and interior corners or angles with joint tape.

3.04 TRIM INSTALLATION

A. Coordinate installation of trim progressively with gypsum board installation where trim is of type required to be installed prior to, or progressively with installation of gypsum board.

B. Securely fasten trim pieces in accordance with manufacturer’s printed instructions.

C. Install cornerbeads at external corners. Install LC-Bead (J-Bead) beads at unprotected (exposed) edges and where gypsum board abuts dissimilar materials. Use single unjointed lengths unless otherwise approved by the Director.

D. Install control joint trim in accordance with ASTM C 840, where indicated.

E. Comply with joint compound manufacturer’s recommended drying time for the relative humidity and temperature at time of application. Allow minimum of 24 hours drying time between applications of joint compound.

F. Except Type X Gypsum Board: Joint compound treatment is not required on gypsum board surfaces installed above suspended ceiling lines.

G. Type X Gypsum Board: Install joint and corner reinforcing and trim, and one coat of joint compound over joints, fastener heads, and metal flanges above suspended ceiling lines.
3.05 LEVELS OF GYPSUM BOARD FINISH

A. General: Finish panels to levels indicated below, in accordance with ASTM C 840, for locations indicated.

1. Level 5 Finish: Provide tape embedded in joint compound over joints and angles, and provide three separate coats of joint compound over all joints, angles, and fastener heads. Cover accessories with three separate coats of joint compound. Joint compounds to be smooth and free of tool marks and ridges. Apply a skim coat. Remove excess material; leave a film covering the paper. Cover the prepared surface with a drywall primer prior to application of the final decoration.

END OF SECTION
SECTION 092213

NON-LOAD BEARING FRAMING AND FURRING

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cold Formed (Load Bearing) Metal Framing: Section 054000.

B. Wood Framing and Furring: Section 061000.

C. Furring For Gypsum Board Ceilings: Section 092214.

D. Gypsum Board Systems: Section 092116.

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for the following:
   1. Studs, Tracks, and Furring.
   2. Fasteners.

B. Samples:
   1. Steel Framing and Furring: 12 inches long, each component.
   2. Fasteners: 10 each type.

1.03 QUALITY ASSURANCE

A. Fire Resistance Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating indicated.

PART 2   PRODUCTS

2.01 MATERIALS

A. Studs, Tracks, and Furring: ASTM C 645; 25 gage galvanized steel, with additional framing members, reinforcing, accessories, and anchors necessary for the complete framing system.

B. Fasteners: Except where shown or specified, select fasteners of type, size, style, grade, and class required for secure installation of framing and furring. Galvanize all fasteners and accessories.
   2. Lag Bolts: FS FF-B-561, square head.
7. Toggle Bolts: Tumble-wing type; FSS FF-B-588, type, class and style as required to sustain load.

C. Anchors: Steel framing manufacturer's recommended types and sizes for substrates involved.

PART 3 EXECUTION

3.01 STEEL FRAMING AND FURRING INSTALLATION

A. Install steel framing, furring and accessories in accordance with manufacturer's printed instructions, unless otherwise shown or specified.

B. Framing Installation:
1. Align tracks accurately at floor and ceiling. Secure tracks as recommended by the framing manufacturer for the upper and lower construction involved, except do not exceed 24 inches oc spacing for nail or powder-driven fasteners, or 16 inches oc for other types of attachment. Provide fasteners approximately 2 inches from corners and ends of tracks.
2. Position studs vertically and engage both upper and lower tracks. Space studs 16 inches on center, unless otherwise indicated on the Drawings. Fasten studs to track flanges with screws or by crimping.
   a. Use full length studs between tracks wherever possible. If necessary, splice studs with a minimum 8 inch nested lap and fasten with two screws per stud flange.
3. Install additional studs to support inside corners at intersections and corners, and to support outside corners, terminations of partitions, and both sides of control joints (if any).
4. Terminate partitions at finish ceiling line unless otherwise indicated on the Drawings.
5. Brace chase wall framing horizontally to opposite studs with 12 inch wide gypsum board gussets or metal framing braces, spaced vertically not more than 4 feet on center.
   a. Attach gypsum board gussets with a minimum 3 screws per stud flange.
   b. Attach metal framing braces with a minimum 2 screws per stud flange.
6. Install rough framing at openings consisting of full-length studs adjacent to jambs and horizontal header and sill tracks. Cut horizontal tracks to length and split flanges and bend webs at ends for flange overlap and screw to jamb studs. Install intermediate studs between jamb studs at head and sill sections, at same spacing as full-length studs.

7. At door frames, install rough framing as specified above. Install jamb studs to comply with framing manufacturer's recommendations for the types of frames and weights of doors required. Fasten jamb studs to metal frames with anchor clips using 2 self-tapping screws or bolts per clip. Where wood frames are shown, fasten jamb studs to rough framing with screws.

8. Where double doors, or doors weighing more than 50 lb are shown or scheduled, install two studs at each jamb and one additional stud not more than 6 inches from jamb studs.

9. Where vertical control joints are shown at jamb lines, install additional vertical studs located on opening side of jambs and not less than 1/2 inch from jamb studs. Do not fasten the additional studs to tracks or jamb studs.

C. Steel Furring Installation: Install steel furring at 16 inches oc maximum spacing and provide additional furring at openings, cutouts, and corners. Securely anchor with fasteners spaced 24 inches oc maximum and stagger on opposite flanges of hat-shaped channels.

D. Tolerances: Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.

END OF SECTION
SECTION 092214

FURRING FOR GYPSUM BOARD CEILINGS

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Non-Load Bearing Framing and Furring: Section 092213.

B. Gypsum Board Systems: Section 092116.

1.02 DEFINITIONS

A. Gages:

B. Galvanizing: Hot dip process, unless otherwise indicated.

1.03 DESIGN REQUIREMENTS

A. The furring system shall support the weight of the ceiling system (including finish) plus the weight of the lighting system. Additional intermediate supports (struts) and hangers shall be included as required to support the required weights.
   1. The actual fixture weights and locations will be furnished by the Electric Work Contractor (through the Director’s Representative).

1.04 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions for the following:
   1. Main Beams.
   2. Cross Channels.
   3. Channel Mold.
   5. Hangers.

1.05 QUALITY ASSURANCE

A. Fire Resistive Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating indicated.

1.06 STORAGE

A. Protect metal items against distortion and rusting.
1.07 PROJECT CONDITIONS

A. Sequencing: Coordinate furring with adjoining Work.
   1. Coordinate delivery of items to be cast in poured concrete, to avoid delay.

PART 2 PRODUCTS

2.01 MATERIALS

A. Main Beams: Minimum 24 gage, 1-1/2 inches by 15/16 inch galvanized steel tee sections, slotted 8 inches oc for intersecting cross channels or cross tees and 4 inches oc for hangers, with integral splices stamped at each end.

B. Cross Channels: Minimum 25 gage, 2-7/8 inches by 7/8 inch galvanized steel hat shaped sections, with stamped locks on each end to fit corresponding slots in main beams and knurled screw surfaces.

C. Channel Mold: Minimum 25 gage, 1 inch by 1 inch by 1/2 inch galvanized steel channel sections.

D. Cross Tees (For Fire Rated Ceiling Systems): Minimum 25 gage galvanized steel tee sections, with stamped locks on each end to fit corresponding slots in main beams.

E. Hangers:
   1. Minimum Size: As specified or shown on the Drawings; if not indicated, comply with minimum size requirements of ASTM C 841 for maximum ceiling area to be supported.
   2. Flat Type: 3/16 x 1 inch mild steel straps, galvanized or painted with black asphaltum paint, punched or drilled for 3/8 inch diameter bolts.
   3. Rod Type: Galvanized mild steel pencil rods.
   4. Wire Type: Type 302 stainless steel.
   5. "T" Type: 16 gage galvanized steel hangers; Fehr Bros. Mfgrs., Inc.'s "T-Hangers".

F. Inserts: Hohmann and Barnard's No. HD Threaded Insert for 1/2 inch diameter bolt.

G. Clips for Attaching Hangers to Steel Joists: Galvanized steel clips or clamps specifically designed for this purpose, which do not depend on friction to hold device in place. Use of drive-on clips or clamps will not be permitted.
H. Welded Studs: Low carbon steel copper flashed studs, 1/4 - 20 UNC, automatic short-cycle welded with a transformer-rectifier power source. When surface on which studs are installed is to receive fireproofing, furnish studs of length to extend one inch below fireproofing.

I. Expansion Anchors: Double cinch type, of soft metal alloy.

J. Bolts: 3/8 inch diameter, length as required for full threads for nut.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:
1. Install Work of this section in accordance with the manufacturer's printed instructions, except as otherwise indicated.
2. Do not bridge expansion joints with grillage.

B. Hangers: Unless otherwise shown, install hangers as follows:
1. Attachment to Poured Concrete Slabs: Embed a part or member of hanger assembly in the concrete in a manner to develop full strength of hanger.
2. Attachment to Structural Steel Framing: Clinch hanger around top flange of steel framing member approximately 135 degrees. If framing member supports roof planks or precast slabs, bolt hanger to center of web or weld to bottom flange. Where applicable, hanger wires may be directly double wound around steel members with wire twisted together securely.
3. Attachment to Steel Joists: Secure hanger with special clip or clamp designed for such use. Where applicable, hanger wires may be directly double wound around steel members with wire twisted together securely.
4. Attachment to Precast Tees, Slabs and Planks: Insert "T" hangers through joints between the units. Where concrete fill is required, lay out and install hangers prior to placing fill.
5. Attachment to Steel Decks: Secure hangers with welded studs. Locate studs as close to deck supports as possible. Install studs in accordance with manufacturer's instructions. After installation, clean stud welds and repair the affected areas of deck and studs with cold galvanizing compound. Attach hangers to stud bolts with double nuts.
6. Attachment to Wood Framing (Except Trusses): Secure hanger with threaded fastener.
7. Attachment to Wood Trusses: Double wind hanger wire around bottom chord member and twist wire together securely.

C. Openings: Frame openings, including openings for items provided under Related Contracts (if any), with extra cross channels or cross tees unless otherwise indicated.
D. Suspended Ceilings:
1. Form suspended ceilings with hangers, channel mold, main beams, cross channels and/or cross tees.
2. Attach hangers to supporting construction, spaced 4 feet oc and within 6 inches of ends of main beams. Where ducts or other items, including items provided under Related Contracts (if any), interfere with the spacing of hangers, install trapeze type hangers under the obstructing items to support ceiling hangers.

END OF SECTION
SECTION 095300
SUSPENDED ACOUSTICAL CEILING SYSTEMS

PART 1 GENERAL

1.01 REFERENCES
A. ASTM C 635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
B. ASTM C 636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
D. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products.

1.02 SYSTEM DESCRIPTION
A. Suspended Ceiling System consisting of main runners and cross runner tees snapped together to form modules or grids for the installation of lay-in acoustical tiles or panels, air diffusers, and light fixtures.
B. Structural Performance and Suspension System Types:
   1. Type HD/EG: Heavy duty, direct hung, exposed grid. (Minimum load carrying capability of main runners: 16 lb/lin ft).
   2. Type HD/CG: Heavy duty, direct hung, concealed grid. (Minimum load carrying capability of main runners: 16 lb/lin ft).

1.03 SUBMITTALS
A. Shop Drawings: Reflected ceiling plans and details that indicate coordinating penetrations and ceiling mounted items, including the following:
   1. Ceiling suspension members.
   2. Method of attaching hangers to supporting building structure.
   3. Ceiling-mounted items including light fixtures; air outlets and inlets; sprinkler heads; and special moldings at walls, columns penetrations, and other junctures with adjoining construction.
B. Product Data: Manufacturer’s catalog sheets, specifications, and installation instructions for the following:
1. Each suspension system type specified.
2. Acoustical units specified.
3. Integral access units.

C. Samples:
1. Suspension System Materials: 12 inches long of exposed suspension system, component members, including moldings, for each color and system type required.
2. Acoustical Units: 12 inches square, each type, pattern, and color specified.

D. Quality Control Submittals:
1. Certification: Manufacturer’s written statement, certifying that the suspension system meets or exceeds the specified structural requirements.

E. Contract Closeout Submittals:
1. Maintenance Instructions: Two copies of the manufacturer’s printed recommendations for cleaning and refinishing the acoustical units. Include precautions regarding materials and methods which may be detrimental to finish and acoustical efficiency.

1.04 QUALITY ASSURANCE

A. Installers Qualifications: The persons installing the suspended acoustical ceiling system and their supervisor shall be personally experienced in suspended acoustical ceiling installation and shall have been regularly employed by a company installing systems for a minimum of 2 years.

B. Surface Burning Characteristics: Tested in accordance with ASTM E 84 and complying with ASTM E 1264 for Class A products.
1. Flame Spread: 25 or less.
2. Smoke Developed: 50 or less.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical units and suspension system components to the Project Site in original, unopened packages and store them in a fully enclosed space protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Open ends of acoustical unit packages 24 hours before installation to stabilize moisture content and temperature.

C. Handle acoustical units carefully to avoid chipping edges or damaging units in any way.
1.06 PROJECT CONDITIONS

A. Environmental Requirements: Comply with acoustical units manufacturer’s printed temperature and ventilation requirements before, during, and after installation.

B. Space Enclosure: Do not install interior acoustical units until space is enclosed and weatherproof, wet work in spaces is completed, and work above ceilings is complete.

1.07 MAINTENANCE

A. Furnish extra materials described below to match products installed, are packaged with protective covering for storage, and are identified with appropriate labels. Furnish quantities equal to 2 percent of acoustical units and exposed suspension system components installed.

PART 2 PRODUCTS

2.01 METAL SUSPENSION SYSTEM MATERIALS

A. Provide manufacturer’s standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.

B. Grid Materials:
   1. Double-web design main runners and cross-runner tees roll-formed from electrogalvanized cold rolled sheet steel with prefinished steel caps on flanges.
      a. Exposed Tees: 9/16 inch wide caps minimum and 15/16 inch wide caps maximum.
   2. Grid Finish: Prepainted white or color as selected from manufacturer’s standard colors.

C. Accessories:
   1. Wall Moldings and Trim: Steel or extruded aluminum of types and profiles indicated, or if not indicated, manufacturer’s standard prefinished moldings for edge penetrations that fit type of edge detail and suspension indicated.
   2. Splines: Type and size required for the specified acoustical units.
   3. Spring Steel Spacers: Designed to hold border acoustical units in compression.
   4. Hold-down Clips: Designed to hold acoustical units in place and, where required, of special type to provide access to plenum.
   5. Impact Clips: Manufacturer’s special spring-type clips, designed to re-position acoustical unit on impact.
   6. Access Components: Manufacturer’s special components for required access above ceiling line.
7. Acoustical Sealant: Manufacturer’s recommended paintable, permanently flexible shrink and stain resistant sealant.

D. Attachment Devices:
   1. Hanger Clips: Galvanized steel clips or clamps specifically designed for attachment to structural steel. Drive-on clips or clamps which depend on friction to hold the device are not acceptable.
   2. Welded Studs: Low carbon steel copper flashed studs, 1/4 - 20 UNC, automatic short-cycle welded to a transformer-rectifier power source. When surface on which studs are to receive fireproofing, furnish studs of length to extend one inch below fireproofing.
   3. Wire Hangers, Braces, and Ties: Galvanized carbon steel, soft temper; prestretched. Yield stress at least 3 times design load but not less than 12 gage, .106 diameter.
   4. Hanger Rods: Mild steel, zinc coated, or protected with rust inhibitive paint.
   5. Flat Hangers: Mild steel, zinc coated, or protected with rust inhibitive paint.
   6. Hanger Tees: Galvanized steel, 16 gage T-hangers for attachment to precast concrete decks.
   7. Expansion Anchors: Double cinch type, of soft metal alloy.
   8. Bolts: 3/8 inch diameter, length as required for full threads of nut.
   9. Miscellaneous Fasteners: Bolts, screws, and other fasteners recommended by suspension system manufacturer and necessary to install the Work.

2.02 ACOUSTICAL UNIT MATERIALS

A. Standard for Acoustical Units: Manufacturer’s standard units of configuration indicated that comply with ASTM E 1414 and ASTM E 1264, conforming to the following:
   1. Noise Reduction Coefficient (NRC) Range: 0.50 - 0.75.
   2. Ceiling Attenuation Class (CAC) Range: 30 - 34.
   3. Light Reflectance Coefficient (LR): 0.75 or greater.

B. Acoustical Units:
   1. Mineral base with factory applied painted finish. (Type III).

C. Panel Dimensions and Edge Details:
   1. Size: 24 x 48 inches; thickness 3/4 inch.
   2. Edges: Square.

D. Pattern Description:
   1. Perforated, small holes.

E. Integral Access Units: Provide 12 x 24 inch access units, formed from special suspension members and matching tile with edges modified to allow removal.
PART 3  EXECUTION

3.01  EXAMINATION

A. Examine substrates and structural framing scheduled to receive the ceiling system for compliance with requirements specified. Do not install the Work until unsatisfactory conditions are corrected.

3.02  INSTALLATION OF SUSPENSION SYSTEM

A. Install acoustical ceiling suspension system to comply with installation standard ASTM C 636, in accordance with the manufacturer’s printed instructions, and CISCA “Ceiling System Handbook”.

B. Lay-out system to a balanced design with edge units no less than 50 percent of acoustical unit size.

C. Hang suspension system independent of walls, columns, ducts, pipes, and conduit.

D. Hangers:
   1. Attach hangers to supporting construction, spaced 4 feet oc maximum and within 6 inches of ends of main beams. Where ducts or other items, including items provided under related contracts (if any), interfere with the spacing of hangers, install trapeze type hangers under the obstructing items to support ceiling hangers.
   2. Wrap hanger wire ends a minimum of three times horizontally, forming tight loops and turning ends upward.
   3. Do not kink or bend hangers as a means of leveling components.

E. Attachment of Hangers to Supporting Construction: Unless otherwise shown, secure the hangers to the construction as follows:
   1. Attachment to Existing Cast-in-Place Concrete: Attach hangers to clip angles, fastened to the concrete with expansion bolts or drive pins.
   2. Attachment to Structural Steel Framing: Clinch hanger around top of flange of steel member approximately 135 degrees. If framing member supports roof planks or precast slabs, bolt hanger to center of web or weld to bottom flange. Where applicable, hanger wires may be directly double wound around steel members with wires twisted together.
   3. Attachment to Steel Joists: Secure hanger with special clip or clamp designed for such use. Where applicable, hanger wires may be directly double wound around steel members with wires twisted together.
   4. Attachment to Precast Tees, Slabs, and Planks: Insert “T” hangers through joints between the units. Where concrete fill is required, lay out and install hangers prior to placing fill.
   5. Attachment to Steel Decks: Secure hangers with welded studs. Locate studs as close to the deck supports as possible. Install studs in accordance with manufacturer’s printed instructions. After installation,
clean stud welds and repair the affected areas of deck and studs with cold galvanizing compound. Attach hangers to studs with double nuts.

6. Attachment to Wood Framing (Except Trusses): Secure hangers with threaded fasteners.

7. Attachment to Wood Trusses: Double wind hanger wire around bottom chord member and twist wire together securely.

F. Suspension System Installation Tolerances:
1. Form right angles at intersections of main and cross runners.
2. Install main runners level to within 1/8 inch in 12 feet. Install cross runners to within 1/32 inch of the required center distances (non-cumulative beyond 12 feet).
3. Align vertical distance of exposed surfaces between intersecting runners to within 0.015 inch.
4. Limit horizontal gaps in exposed surfaces of intersecting or abutting members to within 0.020 inch.

G. Wall Moldings and Trim: Install moldings and trim of type indicated where ceilings intersect vertical surfaces. Use manufacturer’s recommended fasteners suited for secure attachment to the particular substrate.
1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not over 16 inches oc and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

3.03 INSTALLATION OF ACOUSTICAL UNITS

A. Install acoustical units in accordance with the manufacturer’s printed instructions, unless otherwise shown or specified.
1. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
2. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
3. Scribe and cut acoustical units to fit accurately at borders and at penetrations.
4. Where tiles are not supported by suspension members, install splines at unsupported joints.
5. Keep border tiles in compression by inserting spring steel spacers between tiles and moldings. Place one spacer bar at the center of each tile.
6. Locate integral access units to provide uniformly distributed units equal to 20 percent of the total area of each ceiling.
7. Install integral access units in locations shown on the drawings.
8. Hold-down Clips: Install hold-down clips in areas shown on the drawings and in areas required for fire resistance ratings. Space as recommended by panel manufacturer, or as shown or required.
9. Impact Clips: Install impact clip system in accordance with the manufacturer’s printed instructions.

3.04 CLEANING AND ADJUSTING

A. Clean exposed surface of acoustical ceilings, including trim, wall moldings, and suspension members. Comply with manufacturer’s printed instructions for cleaning and touch-up of minor finish damage.

END OF SECTION
SECTION 096519
RESILIENT TILE FLOORING

PART 1  GENERAL

1.01 SUBMITTALS

A. Product Data: Manufacturer's specifications, and surface preparation and installation instructions, for each material specified except primer.

B. Samples:
   1. Resilient Tile: Full size, each type, size, and color required.
   2. Base: 12 inch long sections, each type, size, and color required.
   3. Edge Strips: 12 inch long sections, each type and color required.
   4. Color Samples: Manufacturer's standard colors, patterns, and textures.

C. Quality Control Submittals:
   1. Certificates: Certificates required under Quality Assurance Article.

D. Contract Closeout Submittals:
   1. Maintenance Data: Deliver 2 copies covering the installed products, to the Director's Representative.

1.02 QUALITY ASSURANCE

A. Compatibility of Materials: For each type of tile specified, furnish associated materials made by or recommended by the tile manufacturer.

B. Certifications: Furnish certification from flooring installer that the substrate surfaces have been examined and are acceptable for installation of the Work of this Section.

C. Performance Criteria:
   1. The following criteria are required for products included in this section:
      a. All tile flooring must be certified as compliant with the Greenguard standard by an independent third-party.
      b. Adhesives must not exceed the volatile organic compound (VOC) content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1168.

1.03 PROJECT CONDITIONS

A. Environmental Requirements: Continuously heat spaces to receive flooring to a temperature of 68 degrees F for at least 48 hours prior to flooring installation, during the installation, and for 48 hours after installation.
B. Condition flooring materials by placing them in the spaces where they will be installed for at least 48 hours prior to installation.

1.04 MAINTENANCE

A. Extra Materials:
1. Furnish extra tile, equal to 2 percent of the tile installed, of each type and color of tile required. The extra tile shall be from the same run and lot number as the installed tile.
2. Furnish two extra stair treads, of each type and color of stair treads required. The extra stair treads shall be from the same run and lot number as the installed stair treads.
3. Furnish extra resilient base, equal to 2 percent of the base installed, of each type and color of base required. The extra resilient base shall be from the same run and lot number as the installed resilient base.
4. Place extra materials in storage at the site where directed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Rubber Tile: Virgin rubber and finely ground stabilizing fillers, with fade-resistant color pigments, fire retardant compounds, migrating waxes and soil releasing agents; nominal 39.53 x 35.53 inch size, minimum 0.14 inch gage.
1. Surface Design: (RF-01) Basis of Design Product: norament grano. Hammered profile (0.14 inch).

B. Rubber Base: FS SS-W-40, Type I; 4 inches high, 1/8 inch gage, with matching preformed external corner units.
1. Style: Cove wall base with standard toe.
2. Adhesive and Filler/Wall Patch: As recommended by the base manufacturer for the type of substrate indicated.

C. Rubber Edge Strips: Homogeneous rubber; not less than one inch wide, 1/8 inch gage; tapered bullnose edge.
1. Color/Pattern: Matching floor tile.

D. Rubber Feature Strips: Same material composition and gage as adjoining floor tile. Size and color/pattern shall be as shown on the Drawings.

E. Stair Covering Materials:
1. Stair Treads: Basis of Design Product: norament grano stair treads. Molded rubber, stair nosing, riser and tread in a single piece. - Designed; full width and depth of stair subtread in one piece; raised pattern design.
2. Adhesive: As recommended by the stair covering material manufacturer for the type of substrate indicated.
3. Void Filler: As recommended by the stair tread manufacturer to fill voids and open spaces at the nosing between the stair tread and stair substrate.

F. Underlayment:
   1. Mastic Type: Latex underlayment or other mastic underlayment recommended by flooring material manufacturer for the type of substrate indicated.
       g. Tile Adhesive: Water resistant, formulated for application on type of subfloor indicated, and recommended by the tile manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Examine substrate surfaces to receive the Work of this Section for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected, and installer's substrate surface acceptability certification has been acknowledged by the Director's Representative.
       a. Concrete Subfloor Bond Tests: Check for surface moisture and coatings on concrete subfloor by bond tests as recommended by the tile manufacturer.
   2. Do not install the Work of this Section until after all other finishing operations, including painting, have been completed unless otherwise indicated or directed by the Director's Representative.
       a. Where movable partitions are indicated, install flooring before partitions are erected without interrupting floor pattern.

3.02 SURFACE PREPARATION

A. Unless otherwise specified, follow the materials manufacturers' written instructions.

B. Remove dirt, grease, oil, paint, varnish, wax, sealers, and other contaminants which may impair the full bonding of the materials.

C. Concrete Subfloor:
   1. Remove trowel marks or other projections by grinding or sanding.
   2. Level uneven surfaces with smooth troweling of mastic underlayment. Follow underlayment manufacturer's application and curing instructions.
   3. Provide a substrate surface with not more than 1/8 inch in 10'-0" variation from level or required slope.
   4. If recommended by flooring material manufacturer, treat porous and dusty concrete with primer after vacuum cleaning the surface. Apply primer at the rate recommended by the primer manufacturer.
D. Immediately before application of the flooring adhesive, vacuum clean the prepared subfloor surface.

3.03 INSTALLATION

A. Install the flooring from center marks established with principal walls; lay out the tile field and adjust to avoid use of cut units less than one-half tile wide at perimeters. Match tile units for color and pattern by using the tile in manufactured and packaged sequence.
   1. Lay all tile units with grain running in the same direction.

B. Install tile units in adhesive bed in compliance with manufacturer's printed instructions. Butt tile units tightly to vertical surfaces, thresholds, nosings, and edgings. Scribe tile around obstructions and openings as necessary to produce neat joints. Install tile evenly in straight, parallel lines. Extend tile into toe spaces, door reveals, closets and other similar openings.

C. Install tile on pan type access cover plates for electrical and telephone ducts and other such items which occur within finished resilient tile floor areas. Maintain color and pattern continuity with tile installed on such areas.

D. Install resilient edge strips at unprotected edges of flooring, unless otherwise indicated.

E. Install metal edge strips where indicated. Securely fasten in place.

F. Install resilient base in compliance with manufacturer's printed instructions. Install base on walls, partitions, columns, and permanent fixtures unless otherwise indicated. Install base in as long lengths as practicable, with preformed external corner units. Miter internal corners. Scribe and fit base to door frames and other interruptions.
   1. On masonry and other irregular surfaces, fill voids behind base with filler/wall patch.

G. Install stair covering materials in compliance with manufacturer's printed instructions. Treads, risers, and nosings shall be installed in one piece per step. Closely fit each piece, and adhere over entire substrate surface. Closely fit skirting to stair and stringer profile.
   1. Fill voids and open spaces at the nosing between the stair tread and stair substrate with void filler.

3.04 CLEANING

A. Remove any excess adhesive and other surface soiling from face of installed materials with cleaning agents recommended by the manufacturer of the material being cleaned.
3.05 PROTECTION

A. Protect installed flooring from traffic and damage. Apply non-staining kraft paper covering where necessary. Maintain covering until directed to remove it by the Director's Representative.

3.06 FINISHING

A. Prior to the final inspection, when directed by the Director's Representative, thoroughly clean tile floors and accessories. Comply with the tile manufacturer's recommended cleaning procedures.

END OF SECTION
SECTION 096723

EPOXY RESIN FLOORING

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Concrete Fill: Section 033000 or 033001.

B. Joint Sealants: Section 079200.

1.02 SYSTEM DESCRIPTION

A. Type ECT Flooring and Base: Epoxy composition flooring and base not less than 1/4 inch thick composed of an epoxy resin matrix and mineral filler aggregate, lightly ground, with a cleanable skid-resistant safety topping and sealed finish.

1.03 SUBMITTALS

A. Product Data: Submit printed product descriptions, physical properties data, color charts, specifications, and application instructions as applicable, for each material specified except reinforcement and sealants.

B. Samples:
   1. Flooring and Base Combination: Each type and color; 12 inches x 12 inches x height of base plus one inch, complete with dividing strip at the toe and bead at top of base. Mount sample on plywood.
   2. Underlayment Components: One quart.
   3. Liquid Binder for Reinforcement: One quart.

C. Quality Control Submittals:
   1. Test Reports: At the request of the Director, furnish test reports from an independent testing laboratory showing that the submitted flooring materials meet or exceed specified physical properties and performance requirements.
   2. Certificates: Affidavit required under Article 3.01.
   3. Installer's Qualifications Data: Affidavit required under Quality Assurance Article.
   4. List of Completed Installations: At the request of the Director, furnish a list of at least 5 comparable installations of the submitted flooring materials with a satisfactory service life of not less than 3 years.
D. Contract Closeout Submittals:
   1. Maintenance Data: Deliver 2 copies of the flooring manufacturer's printed recommendations for cleaning and maintaining the installed flooring to the Director's Representative.

1.04 QUALITY ASSURANCE

A. Installer's Qualifications: The person supervising the Work of this Section and the workers installing the flooring system shall be personally experienced in epoxy resin flooring work and shall have been regularly employed by a company engaged in this type of flooring installation for a minimum of 3 years.
   1. Furnish to the Director the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.

B. Materials furnished for each type and color of flooring and base shall be from the same batch number.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Site in factory sealed containers, clearly labeled and marked with manufacturer's name, address, batch number, and date of manufacture.

B. Store materials in accordance with manufacturer's printed instructions.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Maintain temperature and relative humidity conditions necessary for proper installation and curing of the Work. Comply with flooring manufacturer's recommendations.
   2. Maintain sufficient ventilation in areas to receive the Work of this Section. Follow flooring manufacturer's recommendations.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill:
   1. For Thickness up to 2-1/2 inches: Flooring manufacturer's standard or recommended liquid binder, fillers, and aggregate.

B. Underlayment: Liquid binder and filler recommended by the flooring manufacturer.

C. Reinforcement: Continuous filament swirl or woven glass fabric, not less than 4 oz per sq yd, embedded in latex or resin binder.
D. Primer: Flooring manufacturer's standard or recommended type.

E. Type ECT Flooring and Base: Basis of Design Product – Sikafloor Quartzite Broadcast System

1. Epoxy Resin Matrix: Two component epoxy resin base and epoxy curing agent; 100 percent solids, internally colored. Cured binder (matrix) shall be chemically resistant to the following reagents when tested in accordance with ASTM D-543, after immersion time of 7 days:
   a. Soap Solution (1 percent).
   b. Detergent (.025 percent).
   c. Hydrochloric Acid (37 percent).
   d. Acetic Acid (5 percent).
   e. Lactic Acid (5 percent).
   f. Citric Acid (20 percent).
   g. Gasoline (regular).
   h. Ethyl Alcohol.
   i. Uric Acid.

2. Aggregate Fillers: Clean, dry, and dust free inert aggregate. Type, size, color, and proportion recommended by the flooring manufacturer to produce flooring to match the approved sample.

3. Physical properties of cured flooring and base:
   b. Bond Strength: 10,000 psi min, after 7 days, in accordance with ASTM C-579.
   c. Bond Strength: 325 psi min, with concrete failure after 7 day water immersion, in accordance with ACI 403.
   d. Surface Hardness: Shore D Durometer 60 min in accordance with ASTM D-2240.

4. Safety Topping: Two component epoxy resin base and epoxy curing agent with colored siliceous aggregate.

5. Colors:
   a. Colors as indicated on the Drawings, or if not indicated, as selected by the Director from the manufacturer's standard range of colors. Colors chosen for the base may be different from the colors chosen for the flooring in the same area and may differ from space to space.

F. Sealer: Flooring manufacturer's standard or recommended clear sealer.

G. Metal Accessories:
   1. Dividing Strips: Zinc, with 1/8 inch thick vertical leg.
   2. Base Bead: 16 gage zinc, with one inch leg for attachment to wall.
   3. Flashing: 24 oz copper.

H. Sealant: One-part, mildew resistant silicone sealant (Type 1D) specified in Section 079200.
PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine surfaces scheduled to receive the Work of this Section for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Certification: Furnish affidavit by the flooring installer that the surfaces to receive the Work of this Section have been examined and are acceptable for application of the approved flooring. Do not install the flooring until such certification has been acknowledged by the Director in writing.

3.02 PREPARATION

A. Prior to application of surface preparation materials, underlayments and flooring, remove dirt, paint, wax, and other foreign material that may prevent bonding of new materials. Vacuum the entire substrate to remove debris and dust.

B. Unless otherwise recommended by the flooring manufacturer in writing, prepare the substrate as follows:
   1. New Concrete: Mechanically scarify the cured concrete surface, or wash it with a 10 percent muriatic acid solution and rinse thoroughly with clean water and let dry. Locate and mark expansion joints for later installation of dividing strips. Fill and level depressions, voids, cracks, and construction joints with underlayment.

3.03 INSTALLATION

A. Fill: Place fill (or additional underlayment) where shown on the Drawings. For thickness up to 2-1/2 inches, use materials recommended by the flooring manufacturer. For thickness over 2-1/2 inches, use concrete fill specified elsewhere.

B. Waterproofing: Where waterproofing is shown on the Drawings, install membrane in accordance with the manufacturer's printed instructions. Unless otherwise detailed on the Drawings, carry the membrane up vertically to the top of the base, and down into the drain bodies.

C. Reinforcement: Where waterproofing is not required, install reinforcement at intersections of horizontal and vertical surfaces of epoxy flooring. Unless otherwise dimensioned in the manufacturer's printed instructions, turn the reinforcing out onto the horizontal a minimum of 5 inches and up on the vertical to within one inch of the top of base. At floor drains, center a 30 inch square reinforcing membrane over the drain and turn down into drain body.
D. Metal Accessories: Install dividing strips, control joints, expansion joints, and base beads level and true to line. Set accessories in underlayment material to fill voids and substrate irregularities. Position the dividing strips, control joints, expansion joints, and base beads as required to serve as screeds for the required finish thickness of the flooring and base.

1. Control Joints: Where control joints appear in the floor slab, install a dividing strip in the epoxy flooring. Locate the strip vertically above the joint for the full length.
   a. Saw-cut control joints (in lieu of installing dividing strips) where indicated. Cut joints after the flooring has cured, and fill joint with sealant, in accordance with the flooring manufacturer's recommendations.

2. Expansion Joints: Locate at existing building expansion joints and where shown on the Drawings. Carry expansion joints thru the entire flooring system. Where waterproofing membrane is called for, provide membrane joint treatment at expansion joints as recommended by the epoxy flooring manufacturer. Where expansion joint slip cover plates are not required, place a dividing strip on each side of joint and apply sealant as detailed on the Drawings or as recommended by the epoxy flooring manufacturer.

3. Install additional dividing strips at dividing lines between changes of color and types of flooring and base.

4. Install metal base bead along the top edge of projecting bases.

5. Flashings: Install flashings at pipes, conduits, and other items that penetrate thru the floor. Match the height of the wall base, unless otherwise shown on the Drawings.

6. Adjustment of Floor Drains: Perform necessary Work to bring floor drain gratings to the same plane as the adjacent finished epoxy flooring. Adjust clamping rings and flange collars.

E. Flooring and Base:

1. Install flooring and base with a finished thickness of not less than 1/4 inch (exclusive of underlayments, surface preparation materials, waterproofing, and reinforcement). Comply with the manufacturer's printed application instructions, unless otherwise specified.

2. Depositing: Distribute the mix evenly and screed to the required thickness. Compact the mix to eliminate voids and air pockets.
   a. Deposit Limits: Schedule the Work so that, at the end of the work day, the applied flooring terminates at dividing strips, walls, or other definite borders. Terminate the Work by use of bond-breaking temporary screeds only where other methods cannot be executed and where continuation of Work will not leave any visible line in the finished flooring.
   b. Base: Install base of height and type indicated.
3. Grinding (Type ECT): Lightly machine-grind the flooring with a No. 100 stone to obtain a uniform surface, free of trowel marks, waves or other imperfections. Clean and vacuum the floor. Check for voids, pits or other defects. Where required, fill defects with epoxy grout and regrind as necessary. Clean the floor in accordance with the manufacturer's recommendations. Let the floor dry completely before applying sealer.

4. Grinding Base (Type ECT): Where necessary, hand-grind the base to eliminate trowel marks or other rough spots. Provide a surface that is uniformly textured and free of voids, pits, or other defects. Clean the base thoroughly before applying sealer.

5. Applying Safety Topping (Type ECT Flooring and Base):
   a. Vacuum Work surfaces to remove dust.
   b. Apply topping binder and aggregate in accordance with manufacturer's printed instructions.
   c. After binder dries, remove loose aggregate and vacuum the surface to remove dust.
   d. Apply sealer in accordance with manufacturer's printed instructions.

END OF SECTION
SECTION 099101
CONSTRUCTION PAINTING

PART 1  GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE
   A. High-Build Glazed Coatings: Section 099659.

1.02 DEFINITIONS
   A. The word “paint” in this Section refers to substrate cleaners, fillers, sealers,
      primers, undercoats, enamels and other first, intermediate, last or finish coatings.

   B. The word “primer” in this Section refers to substrate cleaners, fillers, sealers,
      undercoats, and other first or intermediate coats beneath the last or finish
      coating.

   C. The words “finish paint” in this Section refers to the last or final coat and
      previous coats of the same material or product directly beneath the last or final
      coat.

   D. Finish Paint Systems: Finish paint and primers applied over the same substrate
      shall be considered a paint system of products manufactured or recommended by
      the finish coat manufacturer.
      1. Finish paint products shall meet or exceed specified minimum physical
         properties.

1.03 SUBMITTALS
   A. Painting Schedule: Cross-referenced Painting Schedule listing all exterior and
      interior substrates to be painted and specified finish paint type designation;
      product name and manufacturer, recommended primers and product numbers,
      and finish paint color designation for each substrate to be painted.
      1. Designate exterior substrates by building name and number, substrate to
         be painted and surface location.
      2. Designate interior substrates by building name and number, floor, room
         name and number, and surface to be painted.

   B. Product Data Sheets: Manufacturer’s published product data sheets describing
      the following for each finish paint product to be applied:
      1. Percent solids by weight and volume, solvent, vehicle, weight per gallon,
         ASTM D 523 gloss/reflectance angle, recommended wet and dry film
         thickness, volatile organic compound (VOC) content in lbs/gallon,
         product use limitations and environmental restrictions, substrate surface
         preparation methods, directions and precautions for mixing and thinning,
recommended application methods, square foot area coverage per gallon, storage instructions, and shelf-life expiration date.

2. Manufacturer’s recommended primer for each finish paint product and substrate to be painted.

3. Manufacturer’s complete range of available colors for each finish paint product to be applied.

C. Finish Paint Type Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.

1. Samples shall be in the designated color and specified ASTM D 523 reflectance.

2. Label each sample with the following information:
   a. Project number and Painting Schedule designation describing substrates and locations represented by the sample.
   b. Finish paint and primer manufacturer, product names and numbers, finish paint color and reflectance.

3. Leave a 1 inch wide exposed strip of unpainted substrate and each coat of primer and finish paint.

4. Sample Sizes:
   a. Wall, Ceiling, and Floor Substrates: 12 inch square panels.
   b. Concrete and Concrete Masonry Unit Substrates: 4 inch square blocks.
   c. Sheet Metals: 4 inch by 8 inch flat sheets.
   d. Bar and Tubular Metals: 8 inch long bars or tubular stock.

D. Quality Control Submittals:

1. Test Reports: Furnish certified test results from an independent testing laboratory, showing that products submitted comply with the specifications, when requested by the Director’s Representative

2. Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.

1.04 QUALITY ASSURANCE

A. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.

1. Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.

B. Container Labels: Label each product container with paint manufacturer’s name, product name and number, color name and number, thinning and application instructions, date of manufacture, shelf-life expiration date, required surface preparations, recommended coverage per gallon, wet and dry film thickness, drying time, and clean up procedures.

C. Field Examples:
1. Prior to on-site painting, at locations designated by the Director’s Representative, apply field examples of each paint type to be applied.

2. Field examples to be applied on actual substrates to be painted and shall duplicate earlier approved paint samples.
   a. Interior field examples to be applied in rooms and spaces to be painted with the same products.
   b. Field Example Minimum Wet and Dry Film Thickness: As indicated on approved product data sheet.
   c. Application: Apply each coat in a smooth uniform wet mil thickness without brush marks, laps, holidays, runs, stains, cloudiness, discolorations, nail holes and other surface imperfections.
      1) Leave a specified exposed width of each previous coat beneath each subsequent coat of finish paint and primer.
   d. Use of Field Examples: Field examples shall serve as a quality control standard for acceptance or rejection of painting Work to be done under this Section.

3. Field Example Sizes:
   a. Floor, Wall, and Ceiling Examples: 200 square feet with 2 foot wide strips.
   b. Door and Frame Examples: One door and frame with 12 inch wide horizontal strips.
   c. Linear Substrate Examples: 20 lineal feet with 12 inch long strips.

4. Do not begin applying paints represented by field examples until examples have been reviewed and approved by the Director’s Representative.
   a. Protect and maintain approved field examples until all painting work represented by the example has been completed and approved.

D. Compatibility of Paint Materials: Primers and intermediate paints shall be products manufactured or recommended by the finish paint manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the Site in original, unopened containers and cartons bearing manufacturer’s printed labels. Do not deliver products which have exceeded their shelf life, are in open or damaged containers or cartons, or are not properly labeled as specified.

B. Storage and Handling: Store products in a dry, well ventilated area in accordance with manufacturer’s published product data sheets. Storage location shall have an ambient air temperature between 45 degrees F and 90 degrees F.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:
1. Ambient Air Temperature, Relative Humidity, Ventilation, and Surface Temperature: Comply with paint manufacturer’s published product data sheet or other printed product instructions.

2. If paint manufacturer does not provide environmental requirements, use the following:
   a. Ambient Air Temperature: Between 45 degrees F and .75 degrees F.
   b. Relative Humidity: Below 75 percent.
   c. Ventilation: Maintain the painting environment free from fumes and odors throughout the Work of this Section.
   d. Surface Temperature: At least 5 degrees F above the surface dewpoint temperature.

3. Maintain environmental requirements throughout the drying period.

B. The following items are not to be painted unless otherwise specified, noted or directed:
   1. Exposed stainless steel, chrome, copper, bronze, brass, and aluminum.
   2. Steel to be encased in cast-in-place concrete.
   3. Top flanges of structural beams and girders in composite concrete-steel construction.
   4. Factory prefinished items.
   5. Exposed structural wood floor joists, subflooring, rafters, roof sheathing and other framing lumber.
   6. Galvanized items not exposed in finished spaces.

1.07 EXTRA MATERIALS

A. Provide extra finish paint materials, from the same production run as paints to be applied, in the following quantities for each color installed:
   1. Paint Type EAL-1 and IAL-1: Four gallons each type.
   2. Paint Types EAL-2 and IAL-2: Two gallons, each type.
   3. Other Paint Types: One gallon, each type.

PART 2 PRODUCTS

2.01 PAINT MANUFACTURERS

A. Where noted, the following finish paint manufacturers produce the paint types specified.
   1. Ameron Protective Coatings, 201 Berry St., Brea, CA 92621, (800) 926-3766.
   3. ICI Dulux Paints, 4000 Dupont Cr., Louisville, KY 40207, (800) 984-5444.
5. PPG Architectural Finishes, One PPG Plaza, Pittsburgh, PA 15272, (800) 441-9695.
7. Valspar Corp., 1401 Severn St., Baltimore, MD 21230, (800) 638-7756.

2.02 MISCELLANEOUS PRODUCTS

A. Bedding Compound: Water based pre-mixed gypsum wallboard joint compound.

B. Cleaning Solvents: Low toxicity with flash point in excess of 100 degrees F.

C. Color Pigments: Pure, nonfading, finely ground pigments with at least 99 percent passing a 325 mesh sieve.
   1. Use lime-proof color pigments on masonry, concrete and plaster.
   2. Use exterior pigments in exterior paints.

D. Masking Tape: Removable paper or fiber tape, self-adhesive and nonstaining.

E. Metal Filler: Polyester resin base autobody filler.

F. Mineral Spirits: Low odor type recommended by finish paint manufacturer.

G. Spackling Compound: Water based pre-mixed plaster and gypsum wallboard finishing compound.

H. Stain Blocker, Primer-Sealer: As recommended by finish paint manufacturer.


2.03 FINISH PAINT TYPES

A. Physical Properties:
   1. Specified percent solids by weight and volume, pigment by weight, wet and dry film thickness per coat, and weight per gallon are minimum physical properties of acceptable materials.
      a. Opaque Pigmented Paints: Physical properties specified are for white titanium dioxide base before color pigments are added.
      b. Specified minimum wet and dry film thickness per coat are for determining acceptable finish paint products. Minimum wet and dry film thickness per coat to be applied shall comply with approved finish paint manufacturer’s product data sheets.
   2. Gloss or Reflectance: The following ASTM D 523 specified light levels and angles of reflectance:
      a. Flat: Below 15 at 85 degrees.
      b. Eggshell: Between 5 and 20 at 60 degrees.
      c. Satin: Between 15 and 35 at 60 degrees.
      d. Semigloss: Between 30 and 65 at 60 degrees.
e. Gloss: Over 65 at 60 degrees.

B. Exterior Finish Paint Types:
   a. Solids by Weight: 47.0 percent.
   b. Solids by Volume: 33.2 percent.
   c. Solvent: Water.
   d. Vehicle: 100 percent acrylic resin.
   e. Weight Per Gallon: 10.0 lbs.
   f. Wet Film Thickness: 4.0 mils.
   g. Dry Film Thickness: 1.3 mils.
   h. Manufacturers: ICI Dulux, PPG, Sherwin-Williams.

   a. Solids by Weight: 79.0 percent.
   b. Solids by Volume: 68.0 percent.
   c. Pigment by Weight: 90.0 percent zinc.
   d. Solvent: Water.
   e. Weight per Gallon: 24.6 lbs.
   f. Dry Film Thickness: 3.0 mils if finish coated, 4.0 mils if not finish coated.

C. Interior Finish Paint Types:
1. Paint Type IAL-1: Interior Acrylic Latex, Flat.
   a. Solids by Weight: 50.0 percent.
   b. Solids by Volume: 32.0 percent.
   c. Solvent: Water.
   d. Vehicle: Vinyl acrylic resin.
   e. Weight Per Gallon: 10.9 lbs.
   f. Wet Film Thickness: 3.8 mils.
   g. Dry Film Thickness: 1.3 mils.
   h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams.

   a. Solids by Weight: 51.0 percent.
   b. Solids by Volume: 35.0 percent.
   c. Solvent: Water.
   d. Vehicle: Vinyl acrylic resin.
   e. Weight Per Gallon: 11.0 lbs.
   f. Wet Film Thickness: 3.8 mils.
   g. Dry Film Thickness: 1.3 mils.
   h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams.

   a. Solids by Weight: 49.0 percent.
   b. Solids by Volume: 35.0 percent.
   c. Solvent: Water.
   d. Vehicle: Vinyl acrylic resin.
   e. Weight Per Gallon: 10.0 lbs.
f. Wet Film Thickness: 3.8 mils.
g. Dry Film Thickness: 1.2 mils.
h. Manufacturers: Benjamin Moore, ICI Dulux, Sherwin-Williams.

5. Paint Type ISP: Interior Steel Primer, Flat.
   a. Solids by Weight: 72.0 percent.
   b. Solids by Volume: 52.0 percent.
   d. Weight Per Gallon: 11.4 lbs.
   e. Wet Film Thickness: 3.0 mils.
   f. Dry Film Thickness: 1.5 mils.
   g. Manufacturers: PPG, Sherwin-Williams, Valspar.

D. Colors: Provide paint colors either shown on contract drawings or to be selected by the Director from finish paint manufacturers available color selections.
   1. Approved finish paint manufacturers to match designated colors of other manufacturers where colors are shown on contract documents.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be prepared, primed, or painted for compliance with contract documents, required environmental conditions, manufacturer’s product data sheets, product label instructions and other written requirements.
   1. Do not begin any phase of the work without first checking and verifying that surfaces and environmental conditions are acceptable for such work and that any earlier phase deficiencies and discrepancies have been properly corrected.
      a. The commencement of new work shall be interpreted to mean acceptance of surfaces to be affected.

3.02 PREPARATION

A. Protection: Cover and protect surfaces to be painted, adjacent surfaces not to be painted, and removed furnishings and equipment from existing paint removals, airborne sanding particles, cleaning fluids and paint spills using suitable drop cloths, barriers and other protective devices.
   1. Adjacent exterior surface protections include roofs, walls, landscaping, driveways and walkways. Interior protections include floors, walls, furniture, furnishings and electronic equipment.
   2. Remove and replace removable hardware, lighting fixtures, telephone equipment, other devices and cover plates over concealed openings in substrates to be painted.
      a. Cover and neatly mask permanently installed hardware, lighting fixtures, cover plates and other devices which cannot be removed and are not scheduled for painting.
3. Schedule and coordinate surface preparations so as not to interfere with work of other trades or allow airborne sanding dust particle to fall on freshly painted surfaces.

4. Provide adequate natural or mechanical ventilation to allow surfaces to be prepared and painted in accordance with product manufacturer’s instructions and applicable regulations.

5. Provide and maintain “Wet Paint” signs, temporary barriers and other protective devices necessary to protect prepared and freshly painted surfaces from damages until Work has been accepted.

B. Clean and prepare surfaces to be painted in accordance with specifications, paint manufacturer’s approved product data sheets and printed label instructions. In the event of conflicting instructions or directions, the more stringent requirements shall apply.

1. Cleaners: Use only approved products manufactured or recommended by finish paint manufacturer. Unless otherwise recommended by cleaner manufacturer, thoroughly rinse with clean water to remove surface contaminants and cleaner residue.

C. Surfaces:

1. Concrete:
   a. Allow three months for poured concrete to dry before painting.
   b. Remove form release agents, laitance, efflorescence, dirt, grease, oils, slurry, chalk deposits, and other surface contaminants using a high-pressure power wash. Use mildewcide solution if mildew is present.
   c. Remove any remaining efflorescence by dampening surface with water and scrubbing with a 5 percent solution of muriatic acid. Rinse with clean water, neutralize with ammonia, rinse and allow to dry.
   d. Vacuum surface clean before painting.
   e. Sandblast to remove any existing deteriorated paint films, curing compounds, concrete sealers, and other substances that may prevent primer adhesion.
   f. Chip and grind surface projections smooth to adjacent surfaces.
   g. Open concealed voids and cracks, remove cement slurry by wire-brushing to expose clean aggregate substrate, and chip out surface honeycomb pockets to allow a neat cementitious patch with square corners and a uniform thickness.
   h. Inspect surfaces to be painted for exposed or rusted steel reinforcement and contact Director’s Representative for a survey of damages to be repaired before substrate can be painted. Do not paint over exposed steel reinforcement without first repairing both deteriorated reinforcement and protective coating.
   i. Use an electronic meter to determine moisture content compliance with finish paint manufacturer’s recommendations.

2. Concrete Masonry Units:
   a. Allow two months for mortar joints to dry before painting.
b. Remove severe lailance, efflorescence, dirt, grease, slurry, chalk deposits and other surface contaminants using a low-pressure power wash. Use mildewcide solution if mildew is present.
c. Remove less severe surface contaminants and contaminant residues by dampening surface with water and scrubbing with a 10 percent solution of muriatic acid.

3. Steel Doors and Frames: Fill indentations and cracks with metal filler; sand smooth to match adjacent undamaged surfaces.

4. Gypsum Wallboard:
   a. Fill cracks, holes, and other indentations smooth to adjacent surfaces using specified bedding, spackling, and finishing compounds.
   b. Gypsum Wallboard: Fill and sand smooth minor bedding and finishing compound defects.
   c. Vacuum and wipe surfaces free of all sanding residue and dust

5. Other Substrates: See finish paint manufacturer’s recommendations.

D. Painting Material Preparations:
   1. Prepare painting materials in accordance with manufacturer’s approved product data sheets and printed label instructions.
      a. Stir materials before and during application for a consistent mixture of density. Remove container surface paint films before stirring and mixing.
      b. Slightly tint first opaque finish coat where primer and finish coats are the same color.
      c. Do not thin paints unless allowed and directed to do so in writing within limits stated on approved product data sheets.

3.03 APPLICATION

A. Environmental Conditions:
   1. Water-based Paints: Apply when surface temperatures will be 50 degrees Fahrenheit to 90 degrees Fahrenheit throughout the drying period.
   2. Other Paints: Apply when surface temperatures will be 45 degrees Fahrenheit to 95 degrees Fahrenheit throughout the drying period.
   3. Apply exterior paints during daylight hours free from rain, snow, fog and mist when ambient air conditions are more than 5 degrees above the surface dewpoint temperature and relative humidity less than 85 percent.
      a. When exterior painting is allowed or required during nondaylight hours, provide portable outdoor weather recording station with constant printout showing hourly to diurnal air temperature, humidity, and dewpoint temperature.
   4. Exterior Cold Weather Protection: Provide heated enclosures necessary to maintain specified temperature and relative humidity conditions during paint application and drying periods.
B. Install approved paints where specified, or shown on the drawings, and to match approved field examples.
   1. Paint Applicators: Brushes, rollers or spray equipment recommended by the paint manufacturer and appropriate for the location and surface area to be painted.
      a. Approved minimum wet and dry film thicknesses shall be the same for different application methods and substrates.

C. Paint Type Coats To Be Applied: Unless specified otherwise by finish paint manufacturer’s product data sheet, the number of coats to be applied for each paint type are as follows:
   1. Paint Types EAL and IAL:
      a. New Unpainted Surfaces: Apply 1 coat of primer and 2 coats of finish paint.
      b. Paint Types IAL: Provide mildewcide additive for bathrooms, kitchens, janitor closets, laundry rooms, restrooms and other wet or damp areas.
      c. Pitted Concrete & Concrete Masonry Surfaces: Use block filler as primer/sealer where allowed by finish paint manufacturer.
   2. Paint Types ESP and ISP: Apply 1 coat.
      a. Do not prime or finish paint steel to be encased in concrete, masonry, or to receive sprayed on fireproofing.
      b. Allow primer to dry one week and test adhesion. Remove and replace defective primer where adhesion failures occur.

D. Surfaces: Unless otherwise specified or shown on the drawings, paint surfaces as follows:
   1. Exterior Surfaces:
      b. Factory Finished Metal Substrates: Field painting not required.
      c. Factory Primed and Unprimed Ferrous Metal Substrates:
         1) Doors, Frames and Trim: Paint Type EAL-3.
         2) Handrails: Paint Type EAL-3.
         3) New Primed Structural Steel: Paint Type EAL-3.
         4) Steel Stairs, Decks and Handrails: Paint Type EAL-3.
   2. Interior Surfaces:
      a. Ceilings: Paint Type IAL-1 except as noted below:
         1) Toilets, Kitchens, Shower Rooms, Janitor Closets and Other Wet Areas: Paint Type IAL-3.
      b. Walls: Paint Type IAL-2.
      c. Doors, Frames and Trim: Paint Type IAL-3.
   3. Unless otherwise noted, paint both exterior and interior exposed wall and ceiling air supply and return grilles; plumbing pipes; electrical panel and fuse boxes, raceways and conduits; heating convector cabinets, radiators, radiator cabinets, unit heaters, and similar existing and installed devices and equipment by other trades.
      a. Paint substrates to match adjacent wall or ceiling surfaces.
      b. Paint exposed surfaces when any part of the surface is on or within 8 inches of ceiling or wall surface to be painted.
      c. Paint visible interior surfaces behind grilles, guards and screens.
4. Doors and Frames: Paint as noted on drawings and schedules.
   a. Where walls are not the same color on both sides of a door frame, change frame color at the inside corner of the frame stop.
   b. Prime and finish paint door faces and edges before installation.
      1) Paint door edges the same paint type color as the exterior side of the door.
   c. Do not paint door components which are clearly not intended to be painted such as non-ferrous hardware, frame mutes, and weather stripping.
   d. Do not allow doors and frames to touch until paint is thoroughly dry on both surfaces.

3.04 FIELD QUALITY CONTROL

A. Paint Samples: Assist the Director’s Representative in obtaining random one quart paint samples for testing at any time during the Work.
   1. Notify the Director’s Representative upon delivery of paints to the Site.
   2. Furnish new one quart metal paint containers with tight fitting lids and suitable labels for marking.
      a. Furnish labor to thoroughly mix paint before sampling and provide assistance with sampling when required.

3.05 ADJUSTING AND CLEANING

A. Reinstall removed items after painting has been completed.
   1. Restore damaged items to a condition equal to or better than when removed. Replace damaged items that cannot be restored.

B. Touch up and restore damaged finish paints. Touch up and restoration paint coats are in addition to the number of specified finish paint coats.

C. Remove spilled, splashed, or spattered paint without marring, staining or damaging the surface. Restore damaged surfaces to the satisfaction of the Director’s representative.

D. Remove temporary barriers, masking tape, and other protective coverings upon completion of painting, cleaning and restoration work.

END OF SECTION
SECTION 099659
HIGH BUILD GLAZED COATINGS

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE
   A. Concrete Unit Masonry: Section 042200.
   B. Painting: Section 099101.

1.02 PERFORMANCE REQUIREMENTS
   A. High Build Glazed Coatings shall meet or exceed the performance requirements of Federal Specification TT-C-550-C.

1.03 SUBMITTALS
   A. Product Data: Catalog sheets, performance charts, specifications, and application instructions for each material specified except miscellaneous materials. Include a statement as to the percentage of solids by volume. In addition to actual material data, submit coating manufacturer’s printed directions and recommendations for environmental conditions, surface preparation, priming, mixing, application, spreading rate, total dry mil thicknesses, and storage.

   B. Samples: Each coating system and color required, on 12 inch square hardboard unless otherwise indicated. Label each sample as to type of system and identify primer, filler, or sealer and finish coats. Leave a narrow strip of each previous coat exposed to view.
   1. On specified concrete masonry, 4 inch square samples of each coating system and color required on masonry.

   C. Quality Control Submittals:
   1. Test Reports:
      a. If requested by the Director, furnish certified test data issued by an independent testing laboratory, demonstrating that the products submitted comply with the required performance requirements.
   2. Applicators Qualifications Data:
      a. Name of each person who will be performing the Work.
      b. Employer’s name, business address, and telephone number.
      c. Names and addresses of the required number of similar projects that each person has worked on which meet the experience criteria.
   3. Certificates: Affidavit required under Quality Assurance Article.
1.04 QUALITY ASSURANCE

A. Qualifications For Products Other Than Those Specified:
   1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
   2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.
      a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
      b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.
         1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
   3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
      a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.
   4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

B. Manufacturer’s Qualifications: The coating manufacturer shall have the technical expertise and qualified technical representatives to advise the Contractor of application procedures required for the coating materials under the particular job conditions.
C. Applicators Qualifications: The persons applying the coating system and their Supervisor shall be personally experienced in high build glazed coating application work and shall have been regularly employed by a Company applying coating systems for a minimum of 5 years.
   1. Furnish to the Director the names and addresses of 5 similar projects which these people have worked on during the past 3 years.

D. Certification: Affidavit by the Company Field Advisor, certifying that the materials comply with New York State Department of Environmental Conservation, Part 205, Architectural Surface Coatings for Volatile Organic Compound (VOC).

E. Compatibility of Materials: For each coating system specified, furnish associated materials made by or recommended by the coating manufacturer.

F. Field Examples:
   1. Prior to performing the Work of this Section, and on actual surfaces designated by the Director’s Representative, apply a sample application of the required coating system. Apply coating system on at least 200 sq ft of surfaces. Do not proceed further until the sample coating application has been approved by the Director’s Representative. Approved sample will be used as quality standard for the Work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the site in original, unopened containers bearing manufacturer’s label. Do not deliver materials which have exceeded shelf life limitation set forth by the manufacturer.

B. Storage and Handling: Store materials in a dry well ventilated place protected from the weather.
   1. Store volatile liquids at temperatures recommended by the manufacturer.

1.06 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Comply with manufacturer’s printed recommendations as to the environmental conditions under which the coating systems can be applied.
   2. Do not apply material in areas where dust is being generated or will be generated while the material is drying.

B. Coordinate coating work with other trades to ensure adequate illumination, ventilation, and a dust free environment during application and curing of coatings.
1.07 MAINTENANCE

A. Extra Materials: Furnish one extra gallon of each type and color of coating material specified. Label each container with manufacturer’s name, product number, color number and location where used.

PART 2 PRODUCTS

2.01 MATERIALS

A. Primers, Sealers, and Undercoats: Products recommended by the coating manufacturer for the substrate unless otherwise specified.
      a. Solids by Volume: 60 to 64 percent.

B. High Build Glazed Coating Systems:
      a. Solids by Volume: 44 to 50 percent.
      b. Finish: Eggshell.
      a. Solids by Volume: 79 to 85 percent.

C. Miscellaneous Materials:
   1. Spackling: FS SS-P-00450.
   2. Polyester Filler: Polyester resin base autobody filler, standard weight or finishing grade as required by conditions, such as Marson’s “White Lightnin” and “Topcoat”.
   3. Cleaning Solvents: Low toxicity, and a flash point in excess of 100 degrees F.
   4. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.
PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces for conditions that will adversely affect execution, performance or quality of the Work of this Section. Do not proceed with the coating systems until conditions are suitable.

3.02 PREPARATION

A. Protection:
1. Prior to surface preparation and coating application, cover or otherwise protect finished Work of other trades and surfaces not being coated or not to be coated.
2. Apply masking tape or other approved surface protection on all in-place hardware, plates, lighting fixtures, and similar items which are not to receive coating, or else remove such items from the surfaces to be finished. Remove such items where required to properly complete the finishing of the adjacent surfaces.
3. Provide “Wet Paint” signs as required to protect newly coated surfaces.

B. Surface Preparation:
1. Concrete and Concrete Masonry Units: Prepare cementitious surfaces to be coated by removing efflorescence, chalk, dust, grease and oils. Surfaces must be dry and fully cured.
2. Ferrous Metals:
   a. Remove dirt and grease with cleaning solvents which will not affect shop prime coat. Wipe off with clean cloths.
   b. Remove rust, mill scale and defective paint or coating down to bare metal, using scraper, sandpaper, or wire brush. Grind if necessary to remove shoulders at edge of sound paint to prevent flaws from photographing through finish coats.
   c. Structural Steel, Metal Stairs, Castellated Steel Beams, Steel Joists and Steel Decks: Clean and touch-up bare spots immediately following erection. Touch-up shall include marred surfaces of the shop coat, field bolts and field welds. Also apply touch-up coat over erection identification marks. Use type of primer specified for the coating system.

C. Materials Preparation:
1. Mix and prepare coating materials in strict accordance with the manufacturer’s directions. Do not exceed manufacturer’s recommended pot life.
2. Thinning: Use only thinners recommended by the coating manufacturer and use only within the recommended or specified limits.
3.03 APPLICATION

A. Apply primers, sealers, fillers, undercoats, and finish coats at manufacturer’s recommended film thickness by brush, roller, or spray applications, whichever is recommended by the coating manufacturer.

B. Concrete Masonry Units: Apply masonry filler at the coverage rate recommended by the manufacturer for the coating system specified. When dry, sand the surface to a smooth finish. Remove dust before applying coating system. Provide a finished coating system free of pinholes.

C. Apply finish coats in even coats of uniform thickness and color without brush marks, roller marks, sags, dry spray, overspray, holidays or lap marks.

D. Allow each coat to dry thoroughly before recoating. Comply with manufacturer’s recommended recoating instructions.

E. Extend coating on walls from top of base to the ceiling line except as otherwise indicated or specified.
   1. Extend coating on walls from floor to the ceiling line where resilient base is scheduled.

3.04 ADJUSTING AND CLEANING

A. Remove masking tape and other protective coverings.

B. Touch up and restore finish where damaged.

C. Remove spilled, splashed, or spattered coating from surfaces. Do not mar surface finish of item being cleaned.

D. After the final coat has dried, reinstall the items which were removed. If damaged or defaced during the performance of the Work, restore such items to a condition equal to or better than they were at the time of removal, or provide new matching items.

3.05 COATING SCHEDULE

A. HBGC-1 Coating System:
   1. Tnemec Series 113 and 114.
      a. Concrete Masonry Units: Total dry mils 12-17.
      b. Concrete: Total dry mils 4-5.
      c. Plaster: Total dry mils 4-5.
      d. Gypsum Board: Total dry mils 5-7.
      e. Galvanized Steel and Non-Ferrous Metal: Total dry mils 4-6.
   2. Valspar Val-Chem Hi-Build 4 Series.
      a. Concrete Masonry Units: Total dry mils 4-5.
      b. Concrete: Total dry mils 4-5.
      c. Plaster: Total dry mils 4-5.
d. Gypsum Board: Total dry mils 4-5.
e. Steel: Total dry mils 8-10.

   a. Concrete Masonry Units: Total dry mils 20.
   b. Concrete: Total dry mils 20.
   d. Gypsum Board: Total dry mils 20.
   e. Galvanized Steel and Ferrous Metal: Total dry mils 6-10.

   a. Concrete Masonry Units: Total dry mils 13-16.
   b. Concrete: Total dry mils 4-6.
   c. Plaster: Total dry mils 5-7.
   d. Gypsum Board: Total dry mils 5-7.
   e. Steel: Total dry mils 6-10.

B. HBGC-3 Coating System:
   1. Tnemec Series 83 Ceramlon II.
      a. Concrete Masonry Units: Total dry mils 16-24.
      b. Concrete: Total dry mils 12-16.
      c. Plaster: Total dry mils 12-16.
      d. Gypsum Board: Total dry mils 5-7.
      e. Steel: Total dry mils 10-14.
   2. Valspar 76 Series:
      a. Concrete Masonry Units: Total dry mils 8-12.
      b. Concrete: Total dry mils 8-12.
      c. Steel: Total dry mils 11-16.
      a. Concrete Masonry Units: Total dry mils 12.
      b. Concrete: Total dry mils 12.
      a. Concrete Masonry Units: Total dry mils 16-24.
      b. Concrete: Total dry mils 8-11.
      e. Steel: Total dry mils 6-12.

D. Surfaces not to be coated unless specifically indicated otherwise:
   1. Face brick.
   2. Pre-finished wall panels, partitions and ceiling tile.
   3. Factory pre-finished items.
   4. Concealed ducts, pipes and conduit.

END OF SECTION
SECTION 101423

SIGNS

PART 1 GENERAL

1.01 REFERENCES

A. Americans with Disabilities Act - 1990.


C. 19 NYCRR Part 1264 – Identification of Building Utilizing Truss Type Construction.

1.02 SUBMITTALS

A. Shop Drawings: Show fabrication and mounting details for each sign type and copy specified. Include sign designs, dimensions, copy style, and copy heights.
   1. For signs supported or anchored to permanent construction provide setting drawings for anchor bolts and other anchors to be installed under other sections.

B. Product Data: Catalog sheets, specifications, and installation instructions for each sign type and mounting type specified.

C. Samples:
   1. Full size of each sign type and copy type specified including mounting accessories. These samples will be returned and, if approved, may be used in the Work.
   2. Color Samples: Manufacturer’s standard colors for sign material and finishes specified.

D. Quality Control Submittals:
   1. Sign Fabricator Qualification Data: Certified statement from the fabricator indicating the capacity and number of years products similar to those specified for the Work have been produced.

1.03 QUALITY ASSURANCE

A. Sign Fabricator Qualifications: The firm manufacturing the signs shall have been regularly producing signs similar to those specified for the Work, for a minimum of 5 years. The firm shall also have sufficient production capacity to produce the quantity of sign units required without causing delay in the Work.

B. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.
1.04 PROJECT CONDITIONS
A. Do not install the sign units until all other finishing operations, including painting, have been completed unless otherwise directed.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Deliver sign units to Site with protective covering in place.
B. Leave protective covering on sign units until completion of installation.

PART 2 PRODUCTS

2.01 MATERIALS
A. Engraved Stock (ES) Plastic: Scratch-resistant, non-static, high pressure laminate with contrasting inner core color.
   1. Finish and Color: As selected from manufacturer’s standard colors and finishes, unless otherwise indicated.
   2. Exposed Engraved Inner Core: White, unless otherwise indicated.
   3. Thickness: 1/8 inch, unless otherwise indicated.
B. Acrylic Sheet: Cast methyl methacrylate monomer plastic sheet, minimum flexural strength of 16,000 psi (ASTM D 790), minimum allowable continuous service temperature of 176 degrees F.
   1. Opaque (Colored) Sheet: Colored sheet as selected from manufacturer’s standard colors and finishes, unless otherwise indicated.
   2. Thickness: 1/8 inch, unless otherwise indicated.
C. Opaque Coating: Sign manufacturer’s standard or recommended non-fading inks, paints or enamels.
D. Mounting Materials:
   1. Mechanical Mounting (MM): Sign manufacturer’s standard or recommended full threaded screws with tamper resistant heads.
      a. Concrete, Masonry, and Plaster Substrates: Furnish plastic anchors with screws.
   2. Tape Mounting (TM): Sign manufacturer’s standard or recommended double sided foam tape intended for substrates involved.
   3. Sealant Mounting (SM): Sign manufacturer’s standard or recommended acrylic or silicone sealant type adhesive intended for substrates involved.

2.02 GRAPHIC PROCESS TYPES
A. Sand Carved (Sand Blasted) Process (SC): Sand carved (sand blasted) letters, numbers, symbols, Grade 2 Braille, and other graphic devices to produce precisely formed copy raised to a uniform height of 1/32 inch with sharply formed edges.
1. Comply with ADA requirements.

B. Dimensional Process (D): Machine cut letters, numbers, symbols, and other graphic devices to produce precisely formed copy raised to a uniform height of 1/8 inch with sharply formed edges. Chemically weld copy to sign panel face.
   1. Comply with ADA requirements.
   2. Copy: To be selected.
      a. Color: As indicated, or if not indicated as selected from the manufacturer’s standard colors.
   4. Sign Panel Face: Clear non-glare acrylic sheet with opaque coating applied to back side of panel.
      a. Opaque Coating Color: As indicated, or if not indicated as selected from the manufacturer’s standard colors.

2.03 PANEL CONFIGURATION

A. Comply with requirements indicated for each sign type and copy. Produce smooth, even, level, sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.

B. Unframed Panel Signs: Fabricate sign units with edges mechanically and smoothly finished to conform with the following conditions:
   1. Edge Condition: Beveled.
   2. Corner Condition: Square.
   3. Border: None.

C. Framed Panel Signs: Fabricate frames to profile indicated to conform to the following conditions:
   1. Frame Material: Acrylic.
   2. Corner Condition: Square.

D. Copy Style:
   2. Style 2: Helvetica Medium, upper case, 3/4 inch height, with appropriate pictogram to match lettering and Grade 2 Braille below copy.
   3. Style 3: Helvetica Medium, upper case, 3/4 inch height, with appropriate pictogram to match lettering, international handicapped accessibility pictogram, and Grade 2 Braille below copy.
6. Style 9 (Truss Identification Sign): Roman Alphanumeric designation of the construction type of the building and alphabetic designation for the structural components. Comply with requirements of NEW YORK STATE DEPARTMENT OF STATE, DIVISION OF CODE ENFORCEMENT AND ADMINISTRATION “EXAMPLE TRUSS IDENTIFICATION SIGN” bound in the Appendix.
   a. Signs Applied to Doors or Sidelights: Permanent non-fading sticker or decal.
   b. Signs not Directly Applied to Doors or Sidelights: Sturdy, non-fading, weather resistant material.
   c. Place the construction type designation at the twelve o’clock position over the structural component designation. Place the structural component designation at the six o’clock position.

E. Copy Position: Refer to drawings for copy orientation.

2.04 FABRICATION

A. Fabricate sign units of graphic process, design, copy, dimensions and color indicated or specified.

B. Copy shall be as stated in MESSAGE SCHEDULE.
   1. Confirm “To Be Determined” information before fabrication.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine surfaces to receive the signs for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install the work of this Section in accordance with the sign manufacturer’s printed installation instructions, except as otherwise indicated or specified.

B. Coordinate sign units with MESSAGE SCHEDULE prior to installation.

C. Secure sign units to surfaces and locations shown on the Drawings with mounting location and mounting method specified.

D. Mounting Locations:
   1. Location A: Latch side of door, sign unit center 60 inches above finished floor and near edge of sign unit 2 inches from outside edge of door frame.
   2. Location B (Truss Identification Sign): Locate sign units in accordance with 19 NYCRR Part 1264, Table I-1264.
3.03 CLEANING AND PROTECTION

A. Do not remove protective coverings until directed.

B. Clean sign units when directed.

END OF SECTION
SECTION 102100

COMPARTMENTS

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Toilet and Bath Accessories: Section 102813.

1.02 DESCRIPTION

A. The following types of compartments are specified under this Section:
   1. Toilet Compartments: Door and partition panels, pilasters, overhead bracing (where required), hardware, fittings, and other appurtenances.
   2. Shower Stalls: Partition panels, pilasters, overhead bracing, fittings, and other appurtenances.
   3. Urinal Screens:
      a. Wall Mounted Urinal Screens: Panel mounted on wall with wing brackets, top and bottom.

1.03 OPTION

A. Where solid phenolic core compartments or solid plastic compartments are indicated on the Drawings, either solid phenolic core panels or solid plastic panels may be provided.

1.04 SUBMITTALS

A. Shop Drawings: Show fabrication details and connections to adjacent Work.

B. Product Data: Catalog sheets, specifications, and installation instructions for the following:
   1. Each Panel Type specified.
   2. Fittings and Fasteners.
   3. Door Hardware.

C. Samples:
   1. Hardware: One each item specified.
   2. Panel Sections: One 12 inch square corner, each type specified.
   4. Pilaster Leveling Device (Ceiling or Floor Type): One complete, each type required; also snap-on plinth.
   5. Bracket Fittings: One each type.
   6. Fasteners: One each type.
1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver material to site in unopened cartons bearing manufacturer’s labels, carefully packaged and protected, so as to prevent damage to panel finishes. Defective panels will not be accepted at the site for installation under this Contract.

B. Storage and Handling: Store and handle partition materials at the site in an approved manner, so as to prevent damage to materials.

1.06 PROJECT CONDITIONS

A. Do not install the Work of this Section until the floors, walls and ceilings of the spaces to receive the Work, have been finished.

PART 2 PRODUCTS

2.01 MATERIALS, FABRICATION, AND MANUFACTURE

A. Solid Phenolic Core Panels:
   1. Fabricate door, partition, and pilaster panels of high-pressure melamine phenolic laminate, pressure-bonded to a solid phenolic core, with edges rounded.
   2. Minimum Thicknesses:
      a. Panels: 1/2 inch.
      c. Doors: 3/4 inch.
   3. Finishes:
      a. Surfaces: Matte finish, manufacturer’s standard color, as selected.
      b. Edges: Manufacturer’s standard colors as selected.

B. Fittings and Fasteners:
   1. Fabricate stirrup wall brackets of heavy duty, chrome plated.
   2. Furnish fittings for wall hung urinal and sight screen brackets of approved heavy duty chrome plated wing type, extending on panels not less than 8 inches.
   3. Fabricate overhead bracing (except at stainless steel partitions) of aluminum tubing with walls not lighter than 16 gage and not smaller than 1 x 1-1/2 inch size. Give aluminum an etched and anodized finish equal to Aluminum Association Designation C22A-41.
   4. Pilaster Leveling Devices:
      a. At floors, a bar type jack screw of approved design.
      b. At ceilings, an approved bar type, including necessary clips, bolts and similar accessories required for a complete installation.
c. Furnish each device with a highly polished, Type 302/304 stainless steel snap-on plinth, not less than 3 inches high to conceal all parts of leveling devices, easily removable for cleaning and pilaster adjustment.

5. Fasteners:
   a. Furnish minimum 1/4 inch diameter machine bolts with tamper resistant heads, finished to match hardware.
   b. Furnish approved concealed fastenings for securing wall hung wedge or wing type urinal screens, and in all other locations required by the Drawings.
   c. Furnish minimum 1/4 inch diameter sex-bolts with tamper resistant heads at stirrup brackets and wing brackets, where thru bolting of panels is required.
   d. Furnish toggle bolts for securing brackets to hollow masonry, except where solid masonry is encountered, in which case, provide Type H/S Drop-In Anchors by the Rawplug Co., Inc., New Rochelle, NY 10802.

C. Concealed Reinforcing:
   1. Steel Reinforcing for Anchorages: 12 gage.
   2. Steel Reinforcing For Tapping: 14 gage.
   3. Wood Reinforcing: Continuous solid wood, minimum 4 inches wide, thickness as required to match pilaster, panel, or door thickness.

D. Wall Supports: Where back-up, upright supports, brackets or plates are indicated and/or required to solidly secure wallhung units, provide them in adequate size, material and number, to support the Work as a part of the Work under this Section and clearly show them on shop drawings.

E. Cut-Outs and Reinforcement:
   1. Provide cut-outs, with concealed reinforcing, as required for hardware, convector covers, pipes, and other obstructions which interfere with pilasters or panels. Edge cut-outs and finish exposed edges to match remaining uncut edges.

F. Door Hardware:
   1. Furnish for each door, as follows:
      a. Hinges: Heavy duty gravity type, either full surface through bolted, clamp flange door and jamb brackets through bolted, or recessed top and bottom door assemblies and clamp flange jamb brackets through bolted. Hinges adjustable to permit door to remain stationary at any desired angle.
      b. Mortise Lock: Stainless steel, thumb turn control inside, tool operated slotted rosette outside for emergency access.
      c. Slide Bolt: Manufacturer’s standard.
      d. Combination Stop and Keeper: Clamp flange type, with securely attached rubber bumper.
      e. Combination Coat Hook and Bumper: Manufacturer’s standard unit, rubber tipped.
f. Wall Bumper: Ives No. 406 or Glynn-Johnson No. 50W rubber dome stop with concealed fastener, for doors opening out and striking adjacent wall at 90 degrees.

g. Door Pull: Manufacturer’s standard, for doors opening out.

2. Furnish chrome plated or stainless steel through bolts, or machine screws as required, with theft proof (one way) heads for all hardware.

PART 3 EXECUTION

3.01 ERECTION

A. Cutting and Drilling:
1. Perform all necessary cutting and drilling of adjacent surfaces required for the installation of the Work.
2. Do all drilling for anchors with carbide or diamond tipped rotary drills of minimum required sizes, so as to minimize damage to adjacent construction and finishes.
3. Protection: In shower areas where new partitions are to be attached to floors, take all precautions required to prevent puncturing floor waterproofing located below floor line. Determine depth of waterproofing and use depth gages on drills or other approved means required to prevent drilling into and damaging the waterproofing.

B. Pilasters:
1. Secure pilasters supported on floors solidly to concrete floor construction.
2. Furnish reinforcing for suspended pilasters, concealed in and independent from ceiling construction. Secure pilasters to reinforcing.
3. Fasten pilaster shoes to pilasters with one fastener on each side.

C. Assemble all Work accurately, free from dents, tool marks, warpage, buckle, open joints, or other defects. Erect Work rigid, plumb, and true to line in the designed location, with doors hung and all hardware, fittings and accessories securely attached. Leave all hardware in perfect operating condition.

3.02 CLEANING

A. Before acceptance, clean Work thoroughly of dirt, grease, and other foreign matter, and leave surfaces in perfect condition.

3.03 PROTECTION

A. After erection, protect Work as necessary to avoid damage. Replace parts damaged in any manner, including adjacent Work that may be incidentally damaged.

END OF SECTION
SECTION 102213
WIRE MESH PARTITIONS

PART 1  GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Masterkeyed Cylinders for Sliding Doors; Deadlocks for Hinged Doors: Section 087100.

1.02 REFERENCES

A. Woven Wire Products Association’s Standards.

B. Structural Welding Code - Steel, AWS D1.1 by the American Welding Society (AWS Code).

1.03 DEFINITIONS

A. Wire Gage: Washburn & Moen gage.

1.04 SUBMITTALS

A. Shop Drawings: Include plan, elevations, details, and connections to adjoining construction.

B. Product Data: Manufacturer’s specifications and installation instructions. Include the following:
   1. Wire and Frames.
   2. Vertical Posts.
   3. Floor Sockets.
   4. Top Capping Bar.
   5. Door Hardware.

C. Samples:
   1. Wire Mesh Panel: Corner sample 2 x 2 feet, showing material, construction, and finish.

PART 2  PRODUCTS

2.01 MATERIALS

A. Wire: Cold drawn steel wire.

B. Frames: Cold rolled steel channels.
1. Frames for Hinged Doors with Deadlocks: Minimum 1-1/2 inch channels.

C. Vertical Posts: Cold rolled steel bars, angles, or channels, or cold drawn steel tubing.

D. Floor Sockets: Ductile iron (weldable).

E. Top Capping Bar: Continuous cold rolled steel channel.

F. Door Hardware: Hardware mounting screws shall be inaccessible from the secure side of the door when the door is locked.
   1. Hinged Doors: Manufacturer’s standard fixed pin steel hinges.
   2. Sliding Doors: Manufacturer’s standard track system, hangers, cylinder hook-type lock, and bottom guide channel.

G. Accessories: Manufacturer’s standard fasteners and accessories, unless otherwise shown.

H. Shop Paint: Steel primer selected from the following:
   1. TNEMEC 10-99 (Red), 10-99G (Green) or 10-1009 (Gray).
   2. Rust-Oleum 769.
   4. Sherwin-Williams “Kromik”.

I. Shop Paint: Partition manufacturer’s standard enamel shop paint.
   1. Color: As selected from manufacturer’s standard colors.

2.02 FABRICATION

A. Comply with Woven Wire Products Association’s Standards and the AWS Code unless otherwise specified or shown.

B. Panels: Tenon and weld frame members at intersections. Wire shall be crimped and woven with ends of wire extended not less than 1 inch through the frame and clinched back on the frame at least 90 degrees. Center mesh in the frame. Tack weld every third wire to back of the frame.

C. Cut Outs: Fabricate partitions with framed cut outs for penetrations through the wire mesh partitions.

D. Shop Painting: Thoroughly clean wire mesh partitions and apply one coat of shop paint.
PART 3 EXECUTION

3.01 INSTALLATION

A. Install wire mesh partitions in accordance with manufacturer’s printed instructions unless otherwise indicated. Fasten to adjoining metal with bolts or tap screws and to adjoining masonry and concrete with expansion bolts.

3.02 ADJUSTING

A. Touch up damaged painted surfaces after installation is completed.

END OF SECTION
SECTION 102600
WALL PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes
   1. Wall Guards
   2. Corner guards.
   3. Abuse-resistant wall coverings.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
   2. Include fire ratings of units recessed in fire-rated walls and listings for door-protection items attached to fire-rated doors.

B. Shop Drawings: For each type of wall showing locations and extent.

C. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.
   1. Include Samples of accent strips and accessories to verify color selection.

D. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:
   1. Wall Guards: 12 inches (300 mm) long. Include examples of joinery, corners, end caps, top caps, and field splices.
   2. Abuse-Resistant Wall Covering: 6 by 6 inches (150 by 150 mm) square.

1.04 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of handrail.

B. Material Certificates: For each type of exposed plastic material.

C. Sample Warranty: For special warranty.
1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.
   1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 48-inch- (1200-mm-) long units.
   2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
   1. Maintain room temperature within storage area at not less than 70 deg F (21 deg C) during the period plastic materials are stored.
   2. Keep plastic materials out of direct sunlight.
   3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).
      a. Store corner-guard covers in a vertical position.
      b. Store wall-guard covers in a horizontal position.

1.08 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
      b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
   2. Warranty Period: Five years from date of Substantial Completion.
PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain wall-products of each type from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

2.03 CORNER GUARDS

A. Surface-Mounted, Plastic-Cover Corner Guards: Manufacturer's standard assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. Kal-Lite Division by Kalwall Corporation
   b. Inpro Corporation.
   c. Pawling Corporation.
2. Cover: Extruded rigid plastic, minimum wall thickness; as follows: in dimensions and profiles indicated on Drawings.
   a. Profile: Nominal 2-inch- (50-mm-) long leg and 1/4-inch (6-mm) corner radius.
   b. Height: As indicated on drawings.
   c. Color and Texture: As selected by Architect from manufacturer's full range.
3. Continuous Retainer: Minimum 0.060-inch- (1.5-mm-) thick, one-piece, extruded aluminum.
4. Retainer Clips: Manufacturer's standard impact-absorbing clips.
5. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

2.04 ABUSE-RESISTANT WALL COVERINGS

A. Abuse-Resistant Sheet Wall Covering: Fabricated from semirigid, plastic sheet wall-covering material.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Kal-Lite Division by Kalwall Corporation
   b. Inpro Corporation.
   c. Pawling Corporation.
2. Size: 48 by 96 inches (1219 by 2438 mm) for sheet as indicated.
3. Sheet Thickness: 0.090 inch (2.3 mm).
4. Color and Texture: As indicated or As selected by Architect from manufacturer's full range of color and texture.

5. Height: As indicated.

6. Trim and Joint Moldings: Extruded rigid plastic that matches wall-covering color.


2.05 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.

B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

C. Adhesive: As recommended by protection product manufacturer.

2.06 FABRICATION

A. Fabricate wall according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.07 FINISHES

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

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
   1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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

3.02 PREPARATION

A. Complete finishing operations, including painting, before installing wall and door protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.03 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. 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 (6.1 m), splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches (305 mm) apart.
   3. Adjust end and top caps as required to ensure tight seams.

C. Abuse-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.04 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION
SECTION 102813

TOILET AND BATH ACCESSORIES

PART 1   GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Compartments: Section 102100.

1.02 SUBMITTALS

A. Shop Drawings: Details for grab bars.

B. Product Data: Specifications or data sheets and installation instructions for each product required.

C. Samples: One full size sample of each product required, unless otherwise specified, complete with mounting devices and fasteners. These samples will be returned unless otherwise specified. If approved, samples may be used in the Work.
   1. Shower Curtain: 12 x 12 inch corner with grommets. This sample will not be returned.

D. Contract Closeout Submittals: Furnish the following, as applicable, for each product required:
   1. Operation and maintenance data.
   2. Parts list.

1.03 QUALITY ASSURANCE

A. Provide products from more than one manufacturer if necessary to meet the requirements of this Section.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer’s original protective packaging.
   1. Furnish items with protective wrappings or covers as required to protect finishes. Do not remove protective coverings until completion of other Work liable to damage accessory finish.

B. Pack products with required trim, mounting devices, fasteners, service tools or keys, and complete installation instructions.
PART 2 PRODUCTS

2.01 MATERIALS

A. Stainless Steel: AISI Type 302/304 with No. 4 satin finish, unless otherwise indicated.
B. Brass: Cast or forged quality alloy, FS WW-P-541D/GEN.
C. Sheet Steel: Cold rolled, commercial quality, ASTM A 366.
D. Mounting Devices and Fasteners: Stainless steel, unless otherwise indicated.
E. Chromium Plating: Nickel and chromium electro-deposited on metal; ASTM B 456, Type SC 2, satin finish unless otherwise indicated.

2.02 FABRICATION

A. Fabricate stainless steel dispenser and disposal units of one-piece welded construction with seamless corners, unless otherwise specified.
   1. Recessed Units: Fabricate with integral, continuous, one piece stainless steel trim flange one inch wide with 1/4 inch return. Furnish flanges free of open mitres.
B. Equip units with keyed vandal-resistant lock where key access is specified.
C. Mounting Devices: If not indicated, furnish type and size compatible with accessory unit specified which will securely mount accessory to wall or partition construction indicated.
   1. Grab Bars: Furnish anchoring devices which will withstand minimum downward pull of 500 pounds.
D. Exposed Mounting Devices and Fasteners:
   1. Type: Theft-resistant.
   2. Finish: Match accessory finish, unless otherwise indicated.

2.03 KEYS AND TOOLS

A. Keys: Furnish minimum of 2 keys and an additional 2 keys for every 6 key operated accessories.
   1. Key similar key access units alike unless otherwise specified.
B. Tools: Furnish socket wrenches compatible with set screws of concealed theft-resistant fastenings. Furnish minimum of 2 wrenches and an additional 2 wrenches for every 6 accessories having such fastenings.
2.04 MIRRORS (PFGM)

A. Types:
   1. Type C: Polished float/plate glass mirror in stainless steel frame.

B. Size: Unless otherwise indicated, furnish mirror units with overall frame size 18 x 36 inches.

C. Mirror Frame and Hanger Assembly: Furnish the following for mirror Type C.
   1. Frame: One of the following options:
      a. Angle Framed Construction: Stainless steel angle frame with No. 4 finish, minimum 5/8 x 5/8 inch x 18 gage, corners mitered, heliarc welded, ground smooth and polished, with 18 gage stainless steel tabs welded on inner side of frame approximately 2 inches on center to hold back plate. Center mirror in the frame and hold in place with shock absorbing cushion at each edge. Top and bottom of frame shall have 2 access holes with permanently fastened mounting nuts and theft-resistant set screws to secure frame to hanger bracket.
   2. Back Plate: One of the following options:
      a. Galvanized steel, 20 gage, full interior area of frame, secured to frame with concealed, cadmium plated screws 6 inches oc. Back plate shall have slots near the top edge, punched in back plate or formed with brackets secured to back plate, to receive upper tabs of mounting frame. Two set screw locking devices, designed for positive concealed locking to mounting frame, shall be securely fastened to back plate near bottom corners.
      b. Galvanized steel, 20 gage, full interior area of frame, secured to frame with stainless steel tabs on frame folded into place.
   3. Mounting Frame (Hanger Bracket): One of the following options, with 3/16 inch cadmium plated steel wall fasteners of type and length to suit wall construction:
      a. Box or rectangular type, welded construction, fabricated of 18 gage galvanized steel, with four 18 gage locking tabs located to align with slots and locking devices on back plate. Mounting frame shall have 4 holes, one near each locking tab, for fastening frame to wall.
      b. H type, welded construction, fabricated of 18 gage galvanized steel, designed to be locked to the frame at top and bottom by the 4 theft-resistant set screws. Mounting frame shall have 4 holes, one near each frame locking point, for fastening frame to wall.

D. Type C Mirror: No. 1 or mirror quality polished float/plate glass, 1/4 inch thick. Two coats of silver shall be factory-applied on the glass, followed by one coat of electrically deposited copper on the silver. Finish mirror back and apply a thick protective coat of heavy waterproof paint.
   1. Mirror Backing: Shock absorbing material over entire back mirror surface.
2.04 DOUBLE ROLL TOILET TISSUE DISPENSERS - SURFACE MOUNTED (DRTTD-SM)

B. Combination double roll toilet tissue holder and shelf. Fabricate shelf 16 to 18 inches long x 5 inches wide of 18 gage stainless steel. The 4 shelf edges shall be flanged down 1/2 inch and bottom of front edge shall be hemmed or returned. Fabricate gusset type mounting brackets of minimum 18 gage stainless steel with 2 holes per bracket for fasteners; weld brackets to shelf. Unit shall have no sharp edges or corners. Fabricate double roll toilet tissue holder of 18 gage steel or heavy die cast Zamak with chromium plating finish, or 18 gage stainless steel. Holders shall accommodate standard 4-1/2 inch wide tissue rolls. Fasten double holder to shelf with acorn nuts.

1. Unit shall have a pilfer resistant locking device for each tissue roll.

2.05 COMBINATION PAPER TOWEL DISPENSERS AND WASTE RECEPTACLES (PTD & WR)

A. Units fabricated of 22 gage stainless steel with dispenser door, waste cabinet access door, and removable and reusable metal or rigid molded plastic waste container equipped with lifting handle. Fabricate doors of 22 gage stainless steel double-pan, or 18 gage stainless steel single-pan, construction. Mount doors on full length, continuous stainless steel hinge. Approximate overall size: 74 inches high x 14 inches wide x 7 inches deep, except where 54 inch high units are indicated. Units shall have towel tray designed to dispense multifold or C-fold towels. Minimum capacity of waste container (for 74 inch high units): 1.3 cu ft. Units shall have key access to dispenser and disposal units, keyed alike.

1. Units shall be semi-recessed handicapped accessible type equipped with integral trim flange.

2.06 FEMININE NAPKIN DISPOSALS - SURFACE MOUNTED (FND-SM)

A. Units fabricated of 22 gage stainless steel with 22 gage stainless steel sloping cover mounted on a full length, continuous stainless steel hinge. Equip cover with a side mounted handle for lifting. Approximate overall size: 11 inches high x 8 inches wide x 4 inches deep. Design disposal to be emptied by a door at bottom, mounted on a full length, continuous stainless steel hinge and equipped with a hidden snap latch. Fabricate back for 3 or 4 point fastening to wall.

2.07 LATHER SOAP DISPENSERS - SURFACE MOUNTED (LSD-SM)

A. Individual surface mounted type consisting of a removable clear glass or clear polyethylene soap container enclosed in a satin finish chromium plated brass or steel case with push-in lather dispenser valve, locked filler cap at top, and separate concealed wall plate for theft-resistant mounting. Soap container capacity: Not less than 12 oz. Valve shall be located above soap level and shall have a self cleaning piston. Fabricate valve and all moving parts of stainless steel. Units shall have viewing slots on both sides of dispenser, filler cap permanently chained to dispenser body, and service key access for refilling.
B. Individual surface mounted horizontal tank type consisting of a 20 gage stainless steel one piece body with polished satin finish, push-in lather dispenser valve with stainless steel mechanism, locked filler cap at top, and stainless steel back with vandal resistant mounting bracket. Soap tank capacity: Not less than 40 oz liquid soap. Approximate overall size: 8-1/8 inches wide x 4-3/4 inches high x 5-1/2 inches deep (wall to tip of valve). Valve shall have bulking multiplier of 10 or more. Units shall have polycarbonate refill window, filler cap permanently secured to dispenser body, and service key access for refilling.

2.08 SHOWER CURTAIN RODS (SCR)

A. Rods of 18 gage x 1-1/4 inch od stainless steel tubing with 1/8 inch thick x 3 inch diameter one-piece die-formed stainless steel flanges at each end, all with satin finish. Equip rods with chromium plated brass or stainless steel hooks spaced on 6 inch centers for 10 percent oversized curtains.

2.09 SHOWER CURTAINS (SC)

A. Curtains of 8 oz white duck, 10 percent oversized, mildew resistant treated and water repellent finished, with hemmed edges all 4 sides. Curtains shall have rust proof metal grommets for hooks on 6 inch centers along top hem. Length as required by curtain hook height.

2.10 TOWEL HOOKS (TH)

A. Towel pin extending approximately 3-1/2 inches from wall and flange approximately 2 x 2 inches, fabricated of chromium plated heavy forged brass or heavy gage stainless steel. Units shall have heavy duty concealed back plate and theft-resistant fastening.

2.11 MOP AND BROOM HOLDERS (M & BH)

A. Units consisting of spring loaded serrated rubber cam attached to a cadmium plated steel holder. Cam shall adjust to accept handles from 7/8 inch to 1-1/4 inch diameter. Mount holders 10 inches on center on a continuous 18 gage stainless steel mop strip projecting at least 3 inches from wall surface. Mop strip shall be length indicated.

1. Furnish 46 inch long mop strip with 5 holders.

2.12 GRAB BARS (GB)

A. Grab bar assemblies consisting of stainless steel tubing with integrally welded mounting flanges secured to concealed tenon plates with theft-resistant fasteners, and complying with the following requirements:

1. Tubing: Stainless steel, 1-1/2 inch od x 18 gage wall thickness. Bend tubing at each end and join to flanges by concealed welding. Total projection from wall line (including bar diameter): 3 inches.

2. Flanges: Stainless steel, 3 inch diameter, 11 gage wall thickness, not less than 1/2 inch deep.
3. Finish: Brush satin finish, unless otherwise indicated.
4. Finish On Grab Bars In Shower And Bathtub Areas: Striated non-slip polished finish in a continuous cross-hatched (diamond) pattern or shot peened non-slip finish, on entire bar surface exclusive of returns (ends).
5. Tenon Plates: Stainless steel, 13 gage discs. Tenon plates shall be designed to allow plate location adjustment.
6. Fasten grab bar flanges to tenon plates with not less than 3 concealed fasteners equally spaced around flange.
8. Configurations: Where only small dimensional variations are involved, manufacturer’s standard dimensions for various configurations may be used where conditions permit.

2.13 SHOWER SEATS

A. Acceptable Manufacturers:
5. General Accessory Manufacturing Co. (GAMCO), One Gamco Place, Durant, OK 74701, (800) 451-5766.

B. Frame and Mounting Brackets: Welded construction of 18-8 alloy Type 304 stainless steel with No. 4 satin finish, with radius and/or deburred exposed edges and corners.
1. Square Tubing: 16 gage.
2. Round Tubing: 18 gage.

C. Fasteners:
1. Corrosion Resistant Fasteners: Brass, bronze, or Type 302 or 304 stainless steel bolts.

D. Type B Shower Seat: L-shaped, fold-up type with slatted phenolic seat, capable of supporting 250 lb load, ADA compliant.
1. Acceptable Seats:
   a. Brey Krause Models S-6279-SS and S-6280-SS.
   b. Seachrome Models SSR-320225-PW and SSL-320225-PW.
   c. TSM Models 731-PH and 731-PHI.
PART 3 EXECUTION

3.01 INSTALLATION

A. Unless otherwise indicated, install Work of this Section in strict accordance with the manufacturer’s instructions.
   1. Install all attachments, anchorage devices, and fasteners as required to securely mount accessory units to types of wall or partition construction indicated.

B. “Model A” Double Roll Toilet Tissue Dispensers - Surface Mounted: Install units back-to-back where possible when indicated for 2 or more compartments with dividing stall partitions. Fasten through backs of dispensers with 1/4 inch diameter sex bolts. Enlarge screw slots in unit back plates as required.

3.02 CLEANING AND POLISHING

A. Remove protective wrappings from installed accessories after completion of other Work liable to damage accessory finish. Remove residue, if any, and polish exposed surfaces.

END OF SECTION
SECTION 104413
FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Fire-protection cabinets for the following:
      a. Portable fire extinguisher.

B. Related Requirements:
   1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets

1.03 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to fire-protection cabinets, including, but not limited to, the following:
      a. Schedules and coordination requirements.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing semirecessed method and relationships of box and trim to surrounding construction.
   2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire-protection cabinets.
   1. Include plans, elevations, sections, details, and attachments to other work.

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

D. Samples for Initial Selection: For each type of exposed finish required.

E. Samples for Verification: For each type of exposed finish required, prepared on samples 6 by 6 inches (150 by 150 mm) square.

F. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.
1.05 CLOSEOUT SUBMITTALS
A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.06 COORDINATION
A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
A. Source Limitations: Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.02 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.
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.03 FIRE-PROTECTION CABINET
A. Cabinet Type: Suitable for fire extinguisher.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Guardian Fire Equipment, Inc.
      b. JL Industries, Inc.; a division of the Activar Construction Products Group.
      c. Larsens Manufacturing Company.
B. Cabinet Construction: Nonrated.
C. Cabinet Material: Aluminum sheet.
D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
   1. Rolled-Edge Trim: 2-1/2-inch (64-mm) backbend depth.
E. Cabinet Trim Material: Aluminum sheet.
F. Door Material: Aluminum sheet.
G. Door Style: Center glass panel with frame.

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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.
   1. Provide recessed door pull and friction latch.
   2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

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. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
   3. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.
      a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
         1) Location: Applied to cabinet door.
         2) Application Process: Decals.
         3) Lettering Color: Red.
         4) Orientation: Vertical.

K. Materials:
   1. Aluminum: ASTM B221 (ASTM B221M) for extruded shapes and aluminum sheet, with strength and durability characteristics of not less than Alloy 6063-T5 for aluminum sheet.
      a. Finish: Clear anodic.
   2. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.04 GENERAL FINISH REQUIREMENTS


B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

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

3.02 PREPARATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.03 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at height indicated below: Retain "Fire-Protection Cabinets" Subparagraph below if retaining first option in "General" Paragraph above. If more than one height is required, indicate locations for each height. According to NFPA 10, maximum mounting height for fire extinguishers weighing 40 lb (18 kg) or less is 60 inches (1524 mm) from finished floor to top of extinguisher; for those weighing more, it is 42 inches (1067 mm) from finished floor to top of extinguisher. In rooms required to comply with ADA-ABA Guidelines, mounting height for fire extinguishers is not to exceed 48 inches (1219 mm) to the handle.

1. Fire-Protection Cabinets: 42 inches (1067 mm) above finished floor to top of fire extinguisher.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.

2. Provide inside latch and lock for break-glass panels.

3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification:

1. Apply decals at locations indicated.

3.04 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION
SECTION 104416
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Requirements:
   1. Section 104413 "Fire Protection Cabinets."

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to fire extinguishers including, but not limited to, the following:
      a. Schedules and coordination requirements.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.05 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.
1.07 COORDINATION
A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.08 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
   b. Faulty operation of valves or release levers.
2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS
A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
   1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.02 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS
A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Amerex Corporation.
      b. JL Industries, Inc.; a division of the Activar Construction Products Group.
      c. Larsens Manufacturing Company.
   2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
   5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type in Aluminum Container 10-A:120-B:C, 20-lb (9.1-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-aluminum container.
2.03 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Amerex Corporation.
      b. JL Industries, Inc.; a division of the Activar Construction Products Group.
      c. Larsens Manufacturing Company.

   2. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

   1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

2.04 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

   1. Remove and replace damaged, defective, or undercharged fire extinguishers.

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

2.05 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

   1. Mounting Brackets: Top of fire extinguisher to be at 42 inches (1067 mm) above finished floor.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Welded athletic lockers.
   2. Locker benches.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.

B. Shop Drawings: For metal lockers.
   1. Include plans, elevations, sections, and attachment details.
   2. Show locker trim and accessories.
   3. Include locker identification system and numbering sequence.

C. Samples: For each color specified, in manufacturer's standard size.

D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

E. Samples for Verification: For the following products, in manufacturer's standard size:
   1. Lockers and equipment.
   2. Locker benches.

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

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.
1.06  CLOSEOUT SUBMITTALS

A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.07  MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. The following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than five units:
      a. Locks.
      b. Blank identification plates.
      c. Hooks.

1.08  DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.09  FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.10  COORDINATION

A. Coordinate sizes and locations of concrete bases for metal lockers.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.11  WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures.
      b. Faulty operation of latches and other door hardware.
   2. Damage from deliberate destruction and vandalism is excluded.
   3. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01  MANUFACTURERS

A. Source Limitations: Obtain metal lockers, locker benches, and accessories from single source from single locker manufacturer.
   1. Obtain locks from single lock manufacturer.
2.02 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: For lockers indicated to be accessible, comply with applicable provisions in the ABA standards of the Federal agency having jurisdiction and ICC A117.1.

2.03 WELDED ATHLETIC LOCKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ASI Storage Solutions; ASI Group.
2. Penco Products, Inc.
3. Republic Storage Systems, LLC.

B. Perforated Doors: One piece; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges and latch point (bottom) and right-angle single bend at remaining edges for box lockers.
1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.

C. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
1. Size: Nominally 18 inches x 18 inches.
2. Tops and Bottoms: 0.060-inch (1.52-mm) nominal thickness, with single bend at edges.
3. Backs: 0.048-inch (1.21-mm) nominal thickness.
4. Shelves: 0.060-inch (1.52-mm) nominal thickness, with double bend at front and single bend at sides and back.

D. Perforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet with manufacturer's standard diamond perforations.

E. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet or 0.097-inch (2.45-mm) nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.

F. Reinforced Bottoms: Structural channels, formed from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to front and rear of side-panel frames.

G. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.
1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches (51 mm) high. Provide no fewer than three hinges for each door more than 42 inches (1067 mm) high.
2. Continuous Hinges: Manufacturer's standard, steel; side or top mounted as required by locker configuration.
3. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
H. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.
   1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in cylinder locks, or padlocks; positive automatic latching and pre-locking.
      a. Latch Hooks: Equip doors 48 inches (1219 mm) and higher with three latch hooks and doors less than 48 inches (1219 mm) high with two latch hooks; fabricated from 0.120-inch (3.04-mm) nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
      b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a pre-locking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

I. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.

J. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.

K. Hooks: Manufacturer's standard ball-pointed, aluminum or steel; zinc plated.

L. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.

M. Finished End Panels: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet to cover unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of non-recessed metal lockers; finished to match lockers.

N. Materials:
   1. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

O. Finish: Powder coat.
   1. Color: As selected by Architect from manufacturer's full range.

2.04 LOCKS

A. Combination Padlock: Provided by Owner.

2.05 LOCKER BENCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AJW Architectural Products.
   2. ASI Storage Solutions; ASI Group.
   3. Penco Products, Inc.

B. Provide bench units with overall assembly height of 17-1/2 inches (445 mm).
C. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
   1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick (241 mm wide by 32 mm thick) except provide 20- to 24-inch- (508- to 610-mm-) wide tops where accessible benches are indicated.
   2. Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.

D. Fixed-Bench Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:
   1. Tubular Steel: 1-1/2-inch- (38-mm-) diameter steel tubing threaded on both ends, with standard pipe flange at top and bell-shaped cast-iron base; with baked-enamel or powder-coat finish; anchored with exposed fasteners.
      a. Color: As selected by Architect from manufacturer's full range.

E. Materials:
   1. Steel Tube: ASTM A500/A500M, cold rolled.

F. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
   1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
   2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

G. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.

H. Equipment: Provide each locker with an identification plate and the following equipment:
   1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.

I. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds smooth and flush.

J. Accessible Lockers: Fabricate as follows:
   1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
   2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.

K. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

L. Finished End Panels: Fabricated to conceal unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
M. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

2.06 ACCESSORIES

A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

B. Anchors: Material, type, and size required for secure anchorage to each substrate.
   1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
   2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls and floors or support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.02 INSTALLATION

A. Install lockers level, plumb, and true; shim as required, using concealed shims.
   1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
   2. Anchor single rows of metal lockers to walls near top and bottom of lockers of lockers and to floor.

B. Welded Lockers: Connect groups together with manufacturer's standard fasteners, with no exposed fasteners on face frames.

C. Equipment:
   1. Attach hooks with at least two fasteners.
   2. Attach door locks on doors using security-type fasteners.
   3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
      a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
b. Attach plates to upper shelf of each open-front metal locker, centered, with at least two aluminum rivets.

D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
   1. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
   2. Attach boxed end panels using concealed fasteners to conceal exposed ends of non-recessed metal lockers.
   3. Attach finished end panels using fasteners only at perimeter to conceal exposed ends of non-recessed metal lockers.

E. Fixed Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches (1830 mm) apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

3.03 ADJUSTING

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.

3.04 PROTECTION

A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

B. Touch up marred finishes or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION
SECTION 122413

ROLLER WINDOW SHADES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Manually operated roller shades with single rollers.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
   2. Section 079200 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shade-band materials, their orientation to rollers, and their seam and batten locations.

C. Samples: For each exposed product and for each color and texture specified, 10 inches long.

D. Product Schedule: For roller shades.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shade-band material.

C. Product Test Reports: For each type of shade-band material, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.
1.06  MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.

1.07  QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.
B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.08  DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.09  FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.01  MANUFACTURERS

A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.02  MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Draper Inc.
2. **Hunter Douglas Contract.**
3. **Lutron Electronics Co., Inc.**

**B. Crank-and-Gear Operating Mechanisms:** Sealed gearbox drive system controlled by crank handle.
   1. **Crank-Handle Type:** Detachable.
   2. **Crank-Handle Length:** 10 feet.

**C. Rollers:** Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
   1. **Roller Drive-End Location:** Right side of interior face of shade.
   2. **Direction of Shadeband Roll:** Regular, from back (exterior face) of roller.
   3. **Shadeband-to-Roller Attachment:** Removable spline fitting into integral channel in tube.

**D. Mounting Hardware:** Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

**E. Shadebands:**
   1. **Shadeband Material:** Light-filtering fabric.
   2. **Shadeband Bottom (Hem) Bar:** Steel or extruded aluminum.
      a. **Type:** Enclosed in sealed pocket of shadeband material.
      b. **Color and Finish:** As selected by Architect from manufacturer's full range.

**F. Installation Accessories:**
   1. **Front Fascia:** Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
      a. **Shape:** L-shaped.
      b. **Height:** Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
   2. **Endcap Covers:** To cover exposed endcaps.
   3. **Installation Accessories Color and Finish:** As selected from manufacturer's full range.

**2.03 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 <insert description>.
   3. **Weave:** Mesh <insert description>.
4. Orientation on Shadeband: Up the bolt.
5. Openness Factor: 3 percent.
6. Color: As selected by Architect from manufacturer's full range.

2.04 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
2. Skylight Shades: Provide battens and seams at uniform spacings along shadeband as required to ensure shadeband tracking and alignment through its full range of movement without distortion or sag of material.
3. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.

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

3.02 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

B. Roller Shade Locations: At exterior windows As indicated on Drawings.
3.03 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.04 CLEANING AND PROTECTION

A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION
SECTION 124813

ENTRANCE FLOOR MATS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:
   1. Roll-up rail mats.

1.03 COORDINATION

A. Coordinate size and location of recesses in concrete to receive floor mats and frames.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual
      components and profiles, and finishes for floor mats and frames.

B. Shop Drawings:
   1. Items penetrating floor mats and frames, including door control devices.
   2. Divisions between mat sections.
   3. Perimeter floor frames.

C. Samples: For the following products, in manufacturer's standard sizes:
   1. Floor Mat: Assembled sections of floor mat.
   2. Tread Rail: Sample of each type and color.
   3. Frame Members: Sample of each type and color.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For floor mats and frames to include in maintenance manuals.

PART 2 PRODUCTS

2.01 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

A. Structural Performance: Provide roll-up rail mats and frames capable of withstanding the
   following loads and stresses within limits and under conditions indicated:
   1. Uniform floor load of 300 lbf/sq. ft. (14.36 kN/sq. m).
2. Wheel load of 350 lb (159 kg) per wheel.

B. Accessibility Standard: Comply with applicable provisions in ICC A117.1.

2.02 ROLL-UP RAIL MATS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
2. JL Industries, Inc.; a division of the Activar Construction Products Group.

B. Roll-up, Aluminum-Rail Hinged Mats: Extruded-aluminum tread rails 2 inches (50 mm) wide by 3/8 inch (9.5 mm) thick, sitting on continuous vinyl cushions.
1. Tread Inserts: 1/4-inch- (6.4-mm-) high, 28-oz./sq. yd. (950-g/sq. m) weight, level-cut, nylon-pile, fusion-bonded carpet.
2. Colors, Textures, and Patterns of Inserts: As selected by Architect from full range of industry colors.
5. Mat Size: As indicated on drawings.

2.03 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.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and floor conditions for compliance with requirements for location, sizes, and other conditions affecting installation of floor mats and frames.

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

3.02 INSTALLATION

A. Install recessed mat frames and mats to comply with manufacturer's written instructions so that tops of mats will be flush with adjoining finished flooring. Set mats with tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.
1. For installation in terrazzo flooring areas, allow for grinding and polishing of terrazzo without grinding surface of recessed frames. Coordinate with other trades as required.
2. Install necessary shims, spacers, and anchorages for proper location, and secure attachment of frames.
3. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.
4. Delay setting mats until construction traffic has ended.

B. Install surface-type units to comply with manufacturer's written instructions; coordinate with entrance locations and traffic patterns.
   1. Anchor fixed surface-type frame members to floor with devices spaced as recommended by manufacturer.

3.03 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION
1.01 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Anchor Bolts and Tie Rods: Installed under the work of Section 033000 or 033001.

B. Embedded Sill Members: Installed under the work of Section 033000 or 033001.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Concrete Formwork: Section 031100.

B. Concrete Reinforcement: Section 032100.

C. Cast-In-Place Concrete: Section 033000.

D. Drainage Pipe (from downspouts): Section 334105.

E. Preformed Metal Roofing: Section 074113.

F. Insulated Metal Panels: Section 074213.

G. Flashing and Trim: Section 076000.

H. Gutters and Downspouts: Section 077123.

I. Snow Guards: Section 077253.

J. Steel Doors and Frames: Section 081102.

K. Fiberglass Doors: Section 081613.

L. Aluminum Windows: Section 085113

M. Structured Polycarbonate Panel Assemblies: Section 084513.

N. Composite Sectional Overhead Doors: Section 083325.

O. Finish Hardware: Section 087100.

P. Glass and Glazing for Doors: Section 088100.

Q. Stationary Metal Wall Louvers: Section 089100.
R. Finish Painting of Interior Primed Steel Surfaces: Section 099101.

1.03 REFERENCES

A. Reference Standards: Comply with the following as applicable:


2. Design and Fabrication of Cold-formed Steel Structural Members: “Specification for the Design of Cold-Formed Steel Structural Members” by the American Iron and Steel Institute (AISI Specification).

3. Welding: Comply with the provisions of the “Structural Welding Code - Steel, AWS D1.1” or the “Structural Welding Code - Sheet Steel, AWS D1.3”, by the American Welding Society (AWS Codes).

4. High-Strength Bolting: Provide high strength bolting in accordance with the “Specification for Structural Joints Using ASTM A325 or A490 Bolts” approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation on August 14, 1980 except as follows:
   a. Item 1(c): Wind connections and all other connections transferring moment shall be included among the connections limited to friction-type.
   b. Item 5(b): All high strength bolts shall have a hardened washer under the element (nut or bolt head) turned in tightening, regardless of the method of tightening.
   c. Item 6: The inspection of bolt tightening shall be as specified under Item 6(d). Furnish the calibration device and the inspection torque wrench, and make them available, upon request, to representatives of the State or designated inspection laboratory during the entire period when steel is being fabricated and erected. The inspection torque wrench shall be capable of indicating that the job inspecting torque has been reached by a second method in addition to direct observation of the wrench dial. The inspection wrench calibration and the bolt tightening inspection shall be performed by the Contractor, and shall be witnessed by a representative of the Director or the designated inspection laboratory.


6. Gages:
   b. Steel Wire: U.S. Steel Wire Gage.

1.04 DESIGN REQUIREMENTS
A. **Design Criteria:** Except as shown or specified otherwise, building design shall conform to the Metal Building Manufacturers Association’s (MBMA) “Design Practices” and “Code of Standard Practice”, and with the following criteria:

1. **Wind Loading:** follow ASCE7-10 Design Loads for Buildings and Other Structures, on the vertical building projection.
2. **Roof Snow Loading:** 35 lb/sq ft, minimum, on the horizontal projection of the building roof.
3. **Wind Uplift Loading:** follow ASCE7-10 Design Loads for Buildings and Other Structures, on the horizontal projection of the building roof.
4. **Design load reductions based on tributary loaded area shall not be used.**
6. **Exterior Wall and Roof System Deflection:** Withstand imposed loads with maximum span deflection of L/120.
7. **Building Size:** Not less than the size indicated on the Drawings.
   a. Actual building length shall be to the inside face of exterior end wall panels and shall be equal to the nominal building length.
   b. Actual building width shall be to the inside face of exterior side wall panels and shall be equal to the nominal building width.
8. **Column Fire Rating:** 0 hour.
9. **Grounding:** Building shall be grounded.
10. **Additional Roof Loading:** Photovoltaic Panels as shown in the construction documents, 5 lb/sf minimum loading shall be taken into account for design of building structure.

**1.05 SUBMITTALS**

A. **Shop Drawings:** Drawings shall show specific application to this Project. Submit all required drawings in one submission, except as noted.

1. **Erection Drawings:** Manufacturer’s complete erection drawings. Indicate manufacturer’s identification marking for the components.
2. **Structural Drawings:**
   a. Manufacturer’s drawings showing base plate dimensions and foundation loads for all columns and/or rigid frames.
   b. Manufacturer’s drawings showing anchoring details for the sill members, door jambs, and other miscellaneous items requiring connections to the concrete foundation.
   c. Manufacturer’s details for any proposed wall wind bracing system other than portal columns as shown.
   d. Foundation drawings showing dimensions and elevations of all piers, walls, and footings required.
   e. Anchor bolt plan showing the location of all columns and/or rigid frames, and the location of all necessary anchor bolts or other main framing connections to the concrete foundation.
   f. Anchor bolt and tie rod details.

**Note:** Drawings required under 2.d., 2.e., and 2.f. shall not be submitted until the manufacturer’s drawings required under 2.a., 2.b., and 2.c. have been approved.
Note: Manufacturer’s standard sheets showing loads or details for a multiple range of building spans, heights, and loadings will not be accepted.

B. Product Data: Manufacturer’s catalog sheets, specifications and installation instructions for the following:
1. Ventilators.
2. Sealants and gaskets.

C. Samples:
1. Twelve inch long sections:
   a. Purlin.
   b. Girt.
   c. Thermal break, each type.
3. Color Samples: Manufacturer’s standard colors for exterior wall and roofing panels, trim, and other factory color-coated components.

D. Quality Control Submittals:
1. Design Calculations: Manufacturer’s design calculations, signed and sealed by a licensed Professional Engineer, for the structural framing and exterior wall and roofing panels.
   a. The Engineer’s cover letter shall state that he or she has received a set of the Contract Drawings and Specifications and that the design calculations are based on the requirements of the Contract Drawings and Specifications.
   b. Design shall take into consideration the necessary clearance for the overhead door track at the rigid frame compression flange bracing, and the necessary increase in girt height at the concrete unit masonry core area.
2. Certificates: Metal building manufacturer’s written certification that the structure has been designed in conformance to the specified design loading and other design requirements. Note: This is a pre-award submittal; refer to Supplementary Instructions to Bidders - Condition of Award.

E. Contract Closeout Submittals:
1. Warranties:

1.06 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: The manufacturer of the pre-engineered metal building shall be regularly engaged in the design and fabrication of pre-engineered, pre-fabricated metal buildings, shall have furnished such buildings for five similar projects that have been in use for not less than five years, and shall be subject to the approval of the Director. The building manufacturer shall be capable of furnishing compatible auxiliary building components and accessories shown or specified.
1. If requested, furnish to the Director the names and addresses of five similar projects where the manufacturer’s building has been in use for five years.

B. Installer’s Qualifications: The person supervising the installation of the work of this Section shall be experienced in pre-engineered metal building work, and shall have been regularly employed by a company engaged in the erection and installation of such buildings for a minimum of three years.

1. If requested, furnish to the Director the names and addresses of three similar projects for which the supervisor has supervised the erection and installation of pre-engineered metal buildings.

C. Regulatory Requirements:
   2. Column Fire Rating: Comply with the applicable specifications and details of Underwriters Laboratories, Inc.

D. Inspection: Quality assurance inspection may be made by the State. If quality assurance inspection is made by the State, it shall not relieve the fabricator or erector of responsibility for his own quality control program.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver building components, except structural steel, to the Site in unopened cartons, crates, or other protective containers bearing the manufacturer’s labels.

B. Components shall have manufacturer’s identification marking corresponding to the marking shown on the erection drawings.

C. Keep materials dry while in storage.

D. Handle materials by a method which will prevent damage to components, including finishes.

PART 2 PRODUCTS

2.01 MATERIALS

A. Basic Materials: Except as otherwise specified or indicated on the Drawings, building components and assemblies shall be fabricated from the following applicable materials as required to produce units conforming to the design and types of fabrications required for the building.

1. Structural Steel Members: ASTM A36, A529 or A572 except as otherwise indicated.

2. Cold-Rolled Structural Steel: ASTM A446, Grade A except higher strength grade if needed to comply with design criteria.

3. Cold-Formed Structural Steel: ASTM A570.
4. Structural Steel Tubing: ASTM A500, Grade B or A501.
5. Steel Plate and Bar Stock: ASTM A529 or A572.
6. Steel Pipe: ASTM A53, type and weight as required, Grade B.
7. Anchor Bolts and Tie Rods: ASTM A36 or A675, Grade 70.
8. Clevises, Turnbuckles, and Sleeve Nuts: Similar to those shown in Part 4 of the AISC Manual. The safe working loads shall be adequate for the building furnished.
12. Welding Materials: AWS Codes, type required for materials being welded.
13. Covering Fasteners:
   a. Screw Bolts: Type 300 series stainless steel capped low profile head, 200 inch lb min stripping tongue, color finish on exposed exterior surfaces matching adjacent panels/trim.
   b. Sheet Metal Screws: Type 300 series stainless steel or ASTM A165 cadmium plated case hardened carbon steel, self-drilling or self-tapping, standard hexagonal head or hex-washer head, color finish on exposed exterior surfaces matching adjacent panels/trim.
   c. Rivets: Aluminum, pull type, self-petalling, 1400 lb setting strength, 1650 lb shear strength, 350 lb min push out strength, color cap on exposed exterior surface matching adjacent panels/trim.
15. Cold Galvanizing Compound: Single component compound giving 93 percent pure zinc in the dried film, and complying with DOD-P-21035A (NAVY).
17. Bedding Mortar:
   a. Cement Grout: Portland cement complying with ASTM C150, Type I or III, and clean uniformly graded natural sand complying with ASTM C404, size No. 2; mixed at a ratio (by volume) of 1.0 part cement to 3.0 parts sand, with only the minimum amount of water required for placement and hydration.
   b. Shrink-Resistant Grout: Factory-packaged, shrink-resistant, non-staining, non-ferrous mortar grouting compound selected from the following:
      1) Masterflow 713 by Master Builders.
      2) Sonogrout by Sonneborn.
      3) Five Star Grout by U.S. Grout Corporation.
      4) Crystex by L&M Construction Chemicals.
      5) Non-Corrosive, Non-Shrink Grout by A.C. Horn.

B. Assembly and Installation Accessories: Building manufacturer’s standard reinforcements, extensions, clips, brackets, miscellaneous fasteners and anchoring devices, spacers, furring strips, closures, flashings, expansion joints,
thermal breaks, adhesives, and other components needed for a complete, permanently weatherproof installation. Materials shall be non-deteriorating, corrosion resistant, and compatible with adjoining materials.

C. Connections: Fasteners shall be of size and in quantities to securely and permanently join building components, and shall be complete with necessary hardware and accessories as required for the application. Connections shall allow for expansion and contraction in accordance with the approved design. Screw bolts and rivets shall have metal-backed sealing washers. Except as otherwise indicated, provide the following fastener types for the following locations:

1. Roofing Panels to Structural Members: Screw bolts or rivets.
2. Wall Panels to Structural Members: Screw bolts or standard bolted connection.
3. Wall Panels to Wall Panels: Screw bolts, sheet metal screws or rivets.
4. Interior Liner Panels to Supports: Cadmium plated steel fasteners of required type for secure attachment.
5. Trim: Same fasteners as adjacent panels.

D. Sealants, Gaskets and Closures:

1. Tape Sealant: Flat shaped, elastomeric, non-hardening, ribbon sealant; type recommended by building manufacturer for the particular use and conditions of application.
2. Tube or Pumppable Sealant: Polybutenebutyl or acrylic terpolymer base sealant, or other type sealant recommended by building manufacturer for the particular use and conditions of application.
4. Closures: Closed cell foam or rubber material, formed to match panel profiles, sized to provide weathertightness.

E. Galvanizing: Complying with the following requirements except where otherwise specified.

1. Formed Sheet Steel: ASTM A653, coating designation G-90.
4. Products Fabricated From Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip: ASTM A123.

F. Color Finish: Factory applied color finish system on exposed surfaces of steel components specified to receive color finish, complying with the following requirements:

1. Surface Preparation: Galvanized steel shall be given a chemical conversion treatment conforming to Federal Government Specification MIL-C-490A, Type 1, Grade 1.
2. Coating: After conversion treatment, metal shall be precision coated with thermostetting polymerized enamel to a dry film of one mil, plus or minus 0.2 mil, over the entire material width prior to forming of panels.
4. Finish Gloss: Evenly maintained over the entire surface at 30, plus or minus 5 units, as measured on a 60 degrees Gardner photovolt meter for appearance, balance, reflectivity and durability.

5. Colors: As selected by the Director from building manufacturer’s standard colors.

2.02 PRIMARY BUILDING FRAMING

A. Columns, roof beams, trusses, and rigid frames shall be factory fabricated, with required holes in webs and flanges accurately punched or drilled unless otherwise indicated or approved. Enlarging or gouging holes at the site will not be permitted. Base plates, splice plates, stiffener plates, and other required plates shall be shop fabricated and welded in place where applicable.

B. Rigid Frames: Clear span, solid web framing, tapered or uniform depth, welded-up plate section columns and beams.
   1. Rigid Frame Tie Rods and Anchor Bolts:
      a. Tie rods shall be round bars, of constant diameter or with integral upset ends.
      b. The allowable tensile stress on the unthreaded body area of tie rods, and on the tensile stress area of anchor bolt and tie rod threads shall be 22,000 psi.
      c. Tie rods shall not be spliced by welding.

C. Trusses: Open web framing; hot rolled sections, cold formed shapes, or built-up shapes of welded plate construction.

D. Endwall Framing: Corner posts, endposts and rake beams; hot rolled sections, cold formed shapes, or built-up shapes of welded plate construction.

E. Endwall Framing: Rigid frame with full bay loading capacity and endwall columns; built-up shapes of welded plate construction, hot rolled sections, or cold formed shapes.

F. Bracing: Wind bracing and struts, flange and knee bracing, sag rods, and other bracing and support members as required by the building design; steel angles and rods recommended by building manufacturer unless otherwise indicated.

G. Bolts for Field Assembly of Primary Building Framing and Bracing: High strength bolts.

H. Shop Painting: Comply with the following requirements except where otherwise specified:
   1. Steel framing shall be thoroughly cleaned of loose mill scale, loose rust, weld slag, and other foreign material. Oil and grease shall be removed with solvent.
      a. Galvanized items shall be rinsed in hot alkali or in an acid solution and then in clear water. Welded and abraded galvanized surfaces shall be repaired with a 2 mil thick coating of cold galvanizing compound applied in accordance with compound manufacturer’s instructions.
2. One coat of primer paint shall be applied to all steel surfaces except surfaces to be welded and contact surfaces of high strength bolted connections.

2.03 SECONDARY BUILDING FRAMING

A. Purlins: Cold formed steel shapes, or cold formed open web welded trusses.

B. Girts: Cold formed steel shapes.

C. Sill Members: Roll formed galvanized steel base angle (or zee), or galvanized steel base tube with anchors.

D. Overhead Door Frames: Frames shall be fabricated from structural shapes and bars as required to receive overhead doors, with corners fully welded and ground smooth, and with provisions for bracing to building framing. Exterior frames shall be galvanized after fabrication.

E. Framing for Miscellaneous Openings: All openings shall be framed for proper support and attachment. Frames shall be fabricated from structural shapes and bars with corners fully welded and ground smooth, and with provisions for bracing to building framing. Exterior frames shall be galvanized after fabrication.

F. Shop Painting: Comply with the requirements specified for Primary Building Framing.

2.12 FABRICATION

A. Tolerances: Conform to tolerances set forth in MBMA Code of Standard Practice, except as follows:
   1. Alignment and fit-up of welded joints shall conform to the “Structural Welding Code - Steel” (AWS D1.1).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine surfaces to receive the metal building for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Protect factory applied finishes from damage during erection.
B. Clean surfaces to receive the work of this Section.

C. Isolation: Isolate aluminum in contact with cementitious materials and dissimilar metals, except compatible metals. Separate the materials by applying a heavy coat of bituminous paint or 10 mil self-adhesive polyethylene tape on the contact surfaces. Use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

3.03 ERECTION AND INSTALLATION

A. General: Erect and install the metal building and appurtenances in accordance with the manufacturer’s printed instructions except as otherwise specified or required by the Reference Standards. Install the work of this Section so the structure is secure and weathertight, and exposed materials are free of visible dents, scratches, tool marks, cuts, and other imperfections. Install building systems free of rattles, wind whistles, and noise due to thermal movement.

B. Framing Erection:
1. Provide temporary bracing to securely hold members in proper position until permanent bracing is fastened in place.
2. Erect primary and secondary structural members in their designed positions, and fasten each securely in place.
   a. Prepare, place, and cure shrink-resistant grout in accordance with grout manufacturer’s printed instructions.
3. Do not field cut or alter structural members without approval of the Director.
4. After erection, touch-up welded and abraded surfaces, bare spots, and field bolts with shop primer paint.
   a. For galvanized items, first repair galvanized coating with a 2 mil thick coating of cold galvanizing compound applied in accordance with compound manufacturer’s instructions.

C. Related Building Components: Install related components in their designed locations, fitted with required accessories. Securely fasten items to structural supports. Adjust and lubricate operative units for smooth and easy operation. Seal components watertight at junctions with wall and roof systems.

D. Tolerances: Conform to tolerances set forth in MBMA Code of Standard Practice, except as follows:
1. Alignment and fit-up of welded joints shall conform to the “Structural Welding Code - Steel” (AWS D1.1).

3.04 ADJUSTING

A. Restore minor visual damage to factory applied finishes in a manner to match the appearance and performance of the original finish, or remove the damaged parts and replace them with undamaged parts.
3.05 CLEANING

A. Remove strippable protective coatings after completion of work liable to damage the finish. Comply with manufacturer’s recommendations for coating removal.

B. Clean exposed exterior and interior surfaces of exterior wall panels. Remove any residue from strippable coatings. Comply with panel manufacturer’s printed recommendations for cleaning.

END OF SECTION
SECTION 133423
RECTANGULAR SALT STORAGE STRUCTURE

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cast-In-Place Concrete: Section 033000

B. Preformed Metal Roofing: Section 074113.

C. Snow Guards: Section 077253.

D. Earthwork: Section 310000.

E. Asphalt Concrete Paving: Section 321216.

1.02 REFERENCES

A. Except where more stringent requirements are specified, comply with the applicable requirements of the following organizations and standards, for products, materials, and construction methods:

1. New York State Uniform Fire Prevention and Building Code; Latest.
3. American Institute of Timber Construction (AITC).
5. American Plywood Association (APA).

1.03 DESCRIPTION

A. Provide design and construction for a permanent salt resistant rectangular type structure suitable for the bulk storage of salt with minimum ground water contamination and capable of storing vehicles within one end of the structure. The structure shall meet or exceed the performance criteria of this specification and the New York State Uniform Fire Prevention and Building Code.

1.04 DEFINITIONS

A. The term “salt” as used in this Section refers to sodium chloride or calcium chloride snow-melting salt.

B. The term “floor” as used in this Section refers to the portion of the asphalt concrete paved surface of the site within the perimeter of the structure.
1.05 PROJECT REQUIREMENTS

A. Size of Salt Storage Structure: Approximately 87.5 feet wide by 96 feet long by 40 feet high (maximum), permanent, rigid, wind and waterproof structure, exclusive of one end entrance way, suitable for the bulk storage of 4,000 rated tons of salt total. Structure shall permit filling by tractor trailer delivery of materials directly into the building.
   1. Rectangular Structure of Type VB Construction using the following:
      a. Wood conventional frame or timber.
      b. Concrete or other types of construction.

B. Storage Method:
   1. Enclose the specified salt capacity entirely within the structure, exclusive of the entrance ways, with pile sides sloped at an assumed 32 degree angle of repose.

C. Interior Space: The salt pile storage floor area shall be entirely free of columns and roof supports of any type allowing unimpeded loading of truck-spreader vehicles with front-end loading equipment.
   1. Minimum Interior Clearance:
      a. 4 feet of unobstructed vertical clearance above the surface of the salt pile when stored at the specified storage capacity
      b. Thirty feet minimum vertical clearance to the bottom of framing for at least one third the interior floor area of the structure and continuing for the full length

D. Barrier Wall or Lining: Suitable interior protective base wall conforming to the following applicable criteria:
   1. Barrier wall shall restrict the salt from contact with the primary building wall components or material subject to salt corrosion unless the primary building wall is specifically resistant to corrosion from salt contact.
   2. Barrier wall shall be a minimum of 8 feet high and of sufficient strength to resist a horizontal impact of 250 pounds per linear foot at 7 feet above the floor, resist the horizontal load of a sand and salt pile weighing 110 pounds per cubic foot and shall resist structural damage from abrasion by salt loading equipment.
   3. If the building layout partially restricts the salt pile with the building walls or with separate containing walls, extend the barrier walls a minimum of 2 feet above the toe of the salt pile. The extension of the barrier walls above the toe shall be of the same material used below the toe level.
   4. Barrier wall materials, except poured in place concrete, shall require minimal maintenance and be arranged for easy replacement of components by maintenance personnel without required use of heavy equipment.
   5. Provide a 4 inch wide yellow painted salt storage limit line around perimeter of interior barrier wall located at the toe of salt pile.
E. Entrance Ways: Roof of entrance ways shall be integral with the main structure and shall project out a minimum of one foot from the point where the salt, stored to capacity, meets the floor surface. Openings shall have protection for interior and exterior sidewall structural members fabricated to resist a horizontal impact of 250 pounds per linear foot at 7 feet above the structure floor and to resist abrasion damage to structural components from wheeled vehicles. Openings shall have roller curtain door protection against birds entering the structure.

1. Number and Size: Unobstructed fully open end. See contract drawings for the door locations and sizes.

F. Roof Ventilation: Suitable openings located at or near the highest and lowest point of the roof providing a ratio of one square inch of free air area for each 55 square feet of structure floor area. Each ventilation opening shall be weatherproof.

G. Foundation: See structural requirements for foundation design data. Specific foundation design shall be submitted with superstructure design using the referenced design data.

H. Exterior Wall Construction: Standard components or an integrated wall system, with the exterior surface constructed to provide a durable weather-resistant barrier with leak proof joints. Exterior surface shall be constructed of materials which may be easily maintained by maintenance personnel with unproprietary products readily available for such purpose.

I. Roofing System: Refer to Section 074113 for Preformed Metal Roof.

J. Building Products: The following minimum required standards shall be met for the products listed:

1. Concrete, if used in the building design, shall be as specified in Section 033000 or 033001. Provide 2 coats of penetrating sealer on the interior surface of the concrete base wall, full height of wall.

2. Wood if used in the building design shall be dressed timber, kiln dried to a maximum moisture content of 19 percent before treatment and grade stamped. Wood exposed to weather, shall be preservative treated with a water-borne preservative, where applicable, the treatment has to be compatible with the stain in item 3 below and for above ground use, complying with American Wood Preserver's Associations UI-04 book, Category (UC3-A) and below ground lumber shall be treated with Category (UC4-B).

3. If wood is used as an exposed exterior surface, minimum acceptable finish shall be 2 coats of protective wood stain meeting the requirements of the Building Codes of New York State Architectural Surface Coatings.

4. Metal, Metal Plates and Fasteners: If used in the building design, shall be designed to resist corrosion due to salt, salt spray or salt vapors.
   a. All metal exposed on the interior, including truss bearing plates, nails, screws, lag bolts, anchor bolts, bolts and washers etc. in contact with preservative treated wood, shall be Type 304 or 316
stainless steel or hot dipped galvanized meeting ASTM A 153/A 153M, Class D.

b. Truss connector plates shall be G-185 hot dipped galvanized steel and epoxy coated in the field.

c. Joist hangers shall be G-185 hot dipped galvanized and epoxy coated in the field.

d. If metal is used as an exposed siding or roofing surface, the metal shall have a corrosion-resistant finish. Exposed galvanized metal or an interior surface of metal is not acceptable.

5. Penetrating Sealer for Concrete Walls: Non-toxic, breathable, clear penetrating sealer intended for 2 coat application, leaving no visible surface residue, color or gloss after curing. Acceptable Products:

a. Airdox 40 by Anti Hydro International, Inc., Newark, NJ
b. Klereseal 940-S by Pecora Corporation, Harleysville, PA
c. Masterseal SL 40 by Master Builders, Inc., Streetsboro, OH
d. Sil-act ATS 100 by Advanced Chemical Technologies, Oklahoma City, OK

1.06 STRUCTURAL REQUIREMENTS

A. Static Snow Load: 40 psf

B. Lateral Wind Load: 105 mph (3 second wind gust) Exposure-B

C. Foundation/Cantilevered Retaining Wall Design:

1. Refer to the Drawings for the Contract Geotechnical Notes for the necessary foundation design parameters.

2. The force acting against the Cantilevered Retaining Wall shall be calculated using the following parameters:

a. Factors of Safety against Sliding and Overturning: 1.5.

b. Moist Unit Weight of Retained Sand/Salt Mixture: 110 pounds per cubic foot.

c. Internal Friction angle of retained Sand/Salt Mixture: 32 Degrees.

d. Active Earth Pressure Coefficient (KA): Calculate assuming that the retained sand/salt mixture will extend to the retaining wall’s top and be laid back at a 32 degree angle of repose above the retained portion as specified by NYSDOT.

e. A minimum horizontal impact load of 250 lb/ft acting at 7 feet above the structure’s floor.

D. Design the main structure of the Salt Storage Building to accommodate the additional loads applied on the structure by the side sheds regardless of when the side sheds are to be constructed.

1.07 SUBMITTALS

A. Pre-award Submittal: Submit 8 copies of the following information, stamped and signed by a NYS licensed Professional Engineer, as proof of conformity to the performance requirements of this Section.
1. Drawings:
   a. Design drawings indicating in detail all features of the proposed structure including, but not limited to, the following:
      1. Foundation and anchor bolt plans and details.
      2. Base wall details.
      3. Entranceway details.
      4. Roofing and ventilation details.
      5. Roof and wall bracing details.
      6. Anchorage and splice details.
      7. Door Details
      8. Roller Curtain Door and Connections to adjacent Structure

2. Complete set of specifications specifying all materials to be provided in the proposed structure and the installation of all the materials.

3. Complete, current, and extensive set of site-specific calculations for the entire structure including but not limited to the following:
   a. Certification that the proposed structure meets all requirements of the New York State Uniform Fire Prevention and Building Code including provisions for drifting and unbalanced snow load, according to ASCE 7-10 - Minimum Design Loads for Buildings and other Structures. This is a pre-award submittal; refer to Section002217 Supplementary Instructions to Bidders - Condition of Award.
   b. Certification that the proposed structure will hold the salt capacity required by the contract documents. This is a pre-award submittal; refer to Section 002217; Supplementary Instructions to Bidders - Condition of Award.
   c. Design loads and load combinations
   d. Foundation design and loads including proposed structures allowable differential settlement
   e. Finite element analysis of any proposed thin shelled structure, any structure that relies on stressed skinned panels to resist lateral loads or any non-conventionally framed structure
   f. Lateral load resisting system calculations showing path of all loads from the roof to the footings
   g. Unbalanced horizontal load of partial sand and salt pile on base wall.

4. Quality Assurance Qualifications: Names and proof of conformity for preparer, fabricator, and erector including but not limited to the following:
   a. Preparer: Names and addresses of 5 previous design projects of preparing construction documents of similar or greater difficulty.
   b. Fabricator: Names and addresses of 5 previously fabricated structures and records on past performance.
   c. Fabricator’s Facility and Equipment: Name and location of the facility including storage capability, heating controls and quality control equipment.
   d. Erector: Names and addresses of 5 previously erected structures.

5. Quality Control Qualifications: Copy of the Quality Control (QC) program including name and experience of fabricator and erector.
B. Quality Control Submittals:
   1. Test Reports; submit 3 copies of each of the following:
      a. Moisture, temperature and fabrication inspection reports, for all
         main material.
      b. Test reports shall be submitted no later than the end of the week
         covered by the reports.

C. The Director reserves the right to consider submittals for a structure varying in
   minor respects from specific requirements.

D. The submittal will be reviewed and 2 stamped copies returned. If returned copies
   are stamped “DISAPPROVED” or “RETURNED FOR CORRECTION”,
   promptly resubmit 8 copies of documentation meeting Contract requirements.

1.08 QUALITY ASSURANCE

A. Preparer’s Qualifications: The person who prepares the drawings, calculations
   and specifications data for the work of this Section shall have successful
   experience, during the past 5 years, in preparing construction drawings that are
   similar to the requirements of this Section and shall have prepared drawings for
   at least 5 structures of equivalent or greater difficulty as required by this Section.
   1. The person preparing drawings, calculations and specifications data shall
      be a NYS licensed Professional Engineer or Registered Architect.

B. Fabricator’s Qualification: The fabricator of the building or building
   components shall have successful experience, during the past 5 years, and be
   regularly engaged in the fabrication of the type building meeting the
   requirements of this Section and shall show evidence of having a adequate
   manufacturing facility, equipment, and quality control equipment. The fabricator
   shall be subject to the Director’s approval.

C. Erector’s Qualification: The building erector shall be regularly engaged in the
   erection of the type building meeting the requirements of this Section and shall
   be subject to the approval of the Director.

1.09 INSPECTION

A. Quality Control Inspection: Maintain Quality Control (QC) inspection during the
   fabrication and erection of the building.
   1. Submit for approval a copy of the QC Programs of the proposed
      fabricator and erector, including a list of their QC personnel and
      respective duties. QC program shall include construction tolerances and
      methods of constructing to the tolerances.

B. Quality Assurance (QA) inspection of building component fabrication may be
   made at the discretion of the Director’s Representatives. The Director’s
   Representative shall be given free and easy access to fabrication shop and field at
   all times that work is in progress. QA inspections will be made without cost to
   the contractor.
1.10 WARRANTY

A. Special Warranty: The one year period required by Paragraph 9.8 of the General Conditions is extended to 2 years for the salt storage structure. Refer to Supplementary Conditions.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS


B. Dome Corporation of North America, 5450 East Street, Saginaw, Mi. 48601, (973) 744-0440 sales@dome-corp-na.com

C. Secor Building Solutions, 13140 West Church Street, Savannah, New York 13146, (315) 365-2838, engineering@secorbuildingsolutions.com

2.02 MATERIALS

A. Materials provided shall have a minimum life expectancy of 25 years and shall have been used for its intended purpose for a minimum of 10 years.

B. As required by the approved construction drawings and specifications and complying with the requirements of this section and applicable references.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine the site area and conditions upon which the storage structure will be constructed. Notify the Director in writing of conditions that will adversely affect the execution and quality of the work of this Section. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION AND ERECTION

A. Install required wall foundations and substructures or supports at the required elevations on properly prepared sub grade, as required for the erection of the complete storage structure.

B. Erect the rectangular salt storage structure and required appurtenances on prepared foundations, conforming to the requirements of this Section, complete and ready for the storage of salt.
C. Install asphalt shingles, and accessories in accordance with the manufacturer’s printed instructions, except as otherwise specified or shown.

D. Install Roller Curtain Doors, and accessories in accordance with the manufacturer’s printed instructions, except as otherwise specified or shown.

END OF SECTION