C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.
   1. HVAC system should be operational prior to arrival of doors. Acceptable humidity shall be no less than 25% or greater than 55%.

1.07 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY

A. Provide manufacturer's warranty for the following term:
   1. Interior Doors: Life of installation.

B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:

B. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
   1. Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Wood doors based on Masonite Architectural/Marshfield Door Systems.
   2. Products by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Oshkosh Architectural Wood Doors: www.oshkoshdoor.com
      b. VT Industries, Inc./Eggers Industires: www.vtindustries.com
      c. Assa Abbloy/Graham Wood Doors: www.grahamdoors.com.
      d. Masonite Architectural dba Algoma Hardwoods Inc., and Marshfield Door Systems : www.masonitearchitectural.com.

2.02 DOORS

A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, "A" Grade Faces, Extra Heavy Duty performance, in accordance with WDMA I.S.1-A.
   2. Wood Veneer Faced Doors: 5-ply veneer and solid core unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Wood veneer facing with factory transparent finish.

2.03 DOOR CORES

A. Non-Rated Solid Core, Smoke, 20 and 45 Minute Rated Doors: Type: particleboard core (PC).
   1. Door types: Flush (F), narrow view glass (NVG), narrow glass short (NGS), half-glass (HG) or other type indicated on the A6 drawings.

B. Non-Rated Solid Core Doors: Type: structural composite lumber core (SCLC).
   1. Door Types: Full glass (FG1) or full glass with mid-rail (FG2).

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: White birch, veneer grade in accordance with quality standard indicated, rotary cut, with book match between leaves of veneer, balance match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Same species as face veneer.
   2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Core Blocking:
   1. Non-Rated Doors - Flush (F), narrow view glass (NVG), narrow glass short (NGS), half-glass (HG) or other type indicated on the A6 drawings.
      a. Provide solid blocks at lock edge, and top of door for closer for hardware reinforcement.
      b. Provide solid blocking for other through-bolted hardware.
   2. Non-Rated Doors - Full glass (FG1) or full glass with mid-rail (FG2).
      a. Solid blocking not required.
   3. All Doors with Closers:
      a. Provide top lock blocking.
      b. Particleboard is not acceptable as blocking material.

C. Fit door edge trim to edge of stiles after applying veneer facing.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY GLAZING - WOOD VENEER DOORS

A. Glazing: Provided by wood door manufacturer as specified in Section 088000.

B. Infill all nail holes, to match wood veneer color, both sides of glazing stops.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Factory finish doors in accordance with approved sample for a transparent finish. Color to be selected by Architect.

B. Finish Type: Water based stain with UV resistant cured polyurethane sealer to comply with EPA Title 5 guidelines for VOC emmisions limitations or UV cured urethane per WDMA TR-8.
   1. Sheen: Satin Gloss.
   2. Testing: ANSI A161 1-1993 Section 9-3 Chemical Resistance.
      a. Chemical Resistance: ANSI A161 1-1993 Section 9-3 Chemical Resistance.
      b. Adhesion: ASTM D 3359 Method B to provide no loss of adhesion.
      c. Water Resistance: Cellulose sponge containing 152 grams of water with no visible discoloration, staining, blistering or grain raise after 24 hours of exposure.

2.08 ACCESSORIES

A. Glazing Stops: Non-fire-rated and 20 minute; Wood, of same species as door facing, mitered corners, flush beads/stops without reveal; prepared for countersink style nails or screws. Nail/screw holes to be filled with wood putty to match wood species. Sand filler smooth.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.02 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION 081416

SECTION 083100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access door and frame units, non-fire-rated, in wall locations.

1.02 RELATED REQUIREMENTS

A. Section 099000 - Painting: Field paint finish.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; current edition.

B. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

A. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

B. Shop Drawings: Indicate exact position of each access door and/or panel unit.

C. Manufacturer's Installation Instructions: Indicate installation requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Access Doors: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the Work include:

B. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements, and aesthetics of the following:
   1. Acudor Products, Inc: www.acudoor.com
      a. Non-Fire Rated Walls - Acudor Products - DW-5040

C. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions, profiles, and formulations are minor and do not change the design concept as judged by the Architect.
   1. Architectural Products Co.: www.archprod.com.
   2. Acudor Products Inc: www.acudor.com.
   3. Cendrex: www.cendrex.com
   4. Morris Group International/Elmdor Stoneman: www.elmdorstoneman.com
   5. Karp Associates, Inc: www.karpinc.com.
   6. Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com.
   7. Morris Group International/Larsen's Manufacturing : www.larsenmfg.com
   8. Nystrom/Babcock Davis: www.babcockdavis.com
   9. J. L. Industries: www.jlindustries.com

2.02 ACCESS DOORS AND PANELS

A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.

2.03 ACCESS DOOR UNITS - WALLS

A. Door and Frame Units: Formed steel.
   1. Frames and flanges: 0.058 inch (16 gage minimum) continuous welded steel.
      a. Grind all welds smooth and flush with adjacent surfaces.

2. Door panels: 0.070 inch (14 gage minimum) single thickness, continuous welded, steel sheet.
   a. Grind all welds smooth and flush with adjacent surfaces.
3. Trim in gypsum board partitions: Galvanized drywall bead.
4. Sizes:
   a. Walls: 16 inch x 16 inch in CMU walls.
5. Hardware:
   a. Hinges for Non-Fire-Rated Units: Concealed.
   b. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
6. Prime coat with alkyd primer.

2.04 FABRICATION

A. Weld, fill, and grind joints to ensure flush and square unit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 083100

SECTION 083323
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead coiling doors, operating hardware, non-fire-rated and exterior; electrically operated.

B. Wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements - Submittal procedures.

B. Section 042000 - Unit Masonry: Openings

C. Section 083326 - Overhead Coiling Grilles.

D. Section 087100 - Door Hardware: Cylinder cores and keys.

E. Section 262717 - Equipment Wiring: Power to disconnect.

F. Section 260533.13 - Conduit for Electrical Systems: Conduit from electric circuit to operator and from operator to control station.

G. Section 260583 - Wiring Connections: Power to disconnect.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; current edition.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.

D. NEMA MG 1 - Motors and Generators; 2014.

E. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. Product Data: Provide general construction, electrical equipment, and component connections and details.

B. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

C. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

D. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.

C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR) or UL (DIR) as suitable for purpose specified.

1.06 WARRANTY

A. Manufacturer Warranty: Two years from date of Substantial Completion against defects in material and workmanship

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the work include:
   1. Exterior Coiling Doors - Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Clopay/Cornell/Cookson - Thermiser Max Insulated Rolling Door #ESD30
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Clopay Building Products/Cornell/Cookson: www.clopaydoor.com/#sle.
      b. McKeon Rolling Steel Door Company: www.mckeondoor.com
      c. Raynor Garage Doors: www.raynor.com
      d. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com.
      e. Overhead Door Corporation: www.overheaddoor.com
      f. Janus International: www.janusintl.com

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.
   1. Capable of withstanding positive and negative wind loads of 20 psf, without undue deflection or damage to components.
   2. Air Infiltration to comply with IECC 2012 requirements of less than 1.0 CFM/FT2.
   3. Slats: Interior and exterior slats of 24/24 gauge, Grade 40 steel, ASTM A 653 galvanized steel zinc coating.
      a. Sandwich slat construction with insulated core of minimum 7/8" foamed-in-place, closed cell urethane insulation.
      b. Insulated slats to have a Flame Spread Index of 0 and Smoke Developed Index of 10 as tested per ASTM E84.
      c. Minimum slat insulation R-value: 7.7
      d. Minimum slat STC rating: 21
   4. Nominal Slat Size: 3 inches wide x 15/16" thick x required length.
   5. Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Interior and exterior face finish to be same as slats and match slat color.
   6. Fabricate interlocking sections with high strength nylon endlocks on alternate slats each secured with two 1/4" rivets. Provide windlocks as required to meet specified windloads.
   7. Interior and Exterior Slat, Guide, Bracket, Hood Finish: Factory coated, baked-on polyester powder coat, minimum 2.5 mils cured film thickness, ASTM D-3363 pencil hardness: H or better.
      a. Color as selected by Architect from manufacturers standard minimum 32 powder coat colors.
   8. Guides: Angles; galvanized steel, minimum thickness 3/16". Top 16 1/2" of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service. Finish to be same as slats and match slat color.
      a. Provide windlock bars of same material when required to meet specified wind load.
   9. Counterbalance Shaft Assembly:

a. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width.
b. Spring Balance: Oil-tempered, heat treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.

10. Brackets: Steel plate; galvanized; minimum thickness 3/16". Finish to be same as slats and match slat color.
11. Hood Enclosure: 24 gauge; galvanized steel. Finish to be same as slats and match slat color.
    a. Provide neoprene/rayon baffle in hood to impede air flow above coil.
12. Electric operation.
13. Mounting: Surface mounted.
14. Weatherstripping:
    a. Bottom Bar: Replaceable, bulb style, compressible EPDM gasket extending into guides.

2.03 EXTERIOR COILING DOOR ELECTRIC OPERATION

A. Electric Operators:
1. Mounting: Side mounted.
2. Motor Enclosure:
   a. Exterior Coiling Doors: NEMA MG 1, Type 4; open drip proof.
3. Motor: Supply industrial duty motor operator - rated for a maximum of 20 cycles per hour, UL listed, Totally Enclosed Non Ventilated gear head operator rated hp as recommended by door manufacture for size and type of door, 120Volts, Single Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, emergency manual chain hoist and control station. Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with #50 roller chain. Operator shall be capable of driving the door at a speed of 8 to 9 inches per second (20 to 23 cm/sec). Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.
4. Motor Voltage: 120 volts, single phase, 60 Hz.
5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA 250, Type 1.
7. Opening Speed: 8 to 9 inches per second.
8. Brake: Adjustable friction clutch type, activated by motor controller.
9. Manual override in case of power failure.

B. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator conforming to UL 325.
1. 24 volt circuit.
2. Surface mounted, at interior door jamb.
3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms conforming to UL 325.
   a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

C. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section 260583.

F. Complete wiring from disconnect to unit components.

G. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079005.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION 083323

SECTION 083613
SECTIONAL DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead sectional doors, manually operated.

B. Operating hardware and supports.

1.02 RELATED REQUIREMENTS

A. Section 079005 - Joint Sealers: Perimeter sealant and backup materials.

B. Section 088000 - Glazing: Glazing for door lights.

1.03 REFERENCE STANDARDS

A. DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors; 2011.

B. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS

A. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

B. Product Data: Show component construction, anchorage method, and hardware.

C. Samples: Submit one panel finish samples, 4 by 4 inch in size, illustrating color and finish.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience.

1.06 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

B. Provide five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sectional Doors: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the work include:
   1. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Overhead Door Company: Thermacore Sectional Steel Door Model #593.

B. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
   1. C.H.I. Overhead Doors: www.chiohd.com.
   2. Clopay Building Products: www.clopaydoor.com.
   3. Overhead Door Company: www.overheaddoor.com
   4. Raynor Garage Doors: www.raynor.com.
   5. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com.

2.02 STEEL DOORS

A. Steel Doors: Flush steel, insulated; standard lift operating style with track and hardware; complying with DASMA 102, Commercial application.
   1. Door Panels: Steel construction; outer steel sheet of 20 gauge, 0.0359 inch minimum thickness, flush profile; inner steel sheet of 20 gauge, 0.0359 inch minimum thickness, flat profile; core reinforcement sheet steel roll formed to channel shape, rabbeted weather joints at meeting rails; polyurethane insulation.
      a. Thermal Values: R-value of 12.76; U-value of 0.078.
      b. Air Infiltration: 0.08 cfm at 15 mph; 0.15 cfm at 25 mph.
   2. Door Nominal Thickness: 1-3/8 inches thick.
   3. Spring Counterbalance: Sized to weight of door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of diecast aluminum with high strength galvanized aircraft cable. Sized with minimum 7 to 1 safety factor.
      a. Standard cycle spring: 10,000 cycles.
   4. Exterior Finish:
      a. Factory finished with polyester baked enamel; color as selected from manufacturers standard line.
   5. Interior Finish:
      a. Factory finished with polyester baked enamel; color as selected from manufacturers standard line.
         1) Interior color to be different from exterior color.
   6. Manual Operation: Chain hoist.

2.03 COMPONENTS

A. Track: Galvanized steel angles, 0.094 inch minimum thickness; 2-5/16 x 4 inch size, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick.

B. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.

C. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.

D. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.

E. Head Weatherstripping: EPDM rubber seal, one piece full length.

F. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

G. Lock: Inside side mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior handle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

3.03 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Anchor assembly to wall construction and building framing without distortion or stress.

C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

D. Fit and align door assembly including hardware.

E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079005.

3.04 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.05 CLEANING

A. Clean doors and frames and glazing.

B. Remove temporary labels and visible markings.

END OF SECTION 083613

SECTION 084313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

C. Weatherstripping.

D. Perimeter sealant.
   1. Perimeter caulking at interior and exterior wall veneer/substrate.
   2. Perimeter expandable spray foam insulation to be installed between exterior veneer/substrate and wood storefront anchorage blocking at frame surround to prevent wall cavity air to infiltrate the back side of the storefront framing.

1.02 RELATED REQUIREMENTS

A. Section 079005 - Joint Sealers: Perimeter sealant and back-up materials.

B. Section 087100 - Door Hardware: Hardware items other than specified in this section.

C. Section 088000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

G. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   1. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

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

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

D. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sq ft.

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

F. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.05 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, and internal drainage details .

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
1. Zero Sightline Operable Vents: Shop drawings to include all anchors, supports, frame attachments, connections, fastening, sealing methods and integration with the storefront system.

C. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
1. Engineering calculations as described are required by Ross-Tarrant Architects, whether or not the listed manufacturers require engineered calculations.
2. Engineering calculations documenting compliance are to be stamped by a registered professional engineer licensed in the State of Kentucky.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

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

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

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. General Contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront system installation. Correct defective Work within a one year period after Date of Substantial Completion.
   1. Includes: glass (including insulated glazing units) near-zero sightline operable vent device anchorage and setting system, sealing, flashing and etc, as it relates to air, water and structural adequacy.

B. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, gloss reduction, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Storefront: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the work include:
   1. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Exterior Storefront: Apogee Enterprises/EFCO, LLC Series 403 Flush Glazed Thermal Screw Spline Storefront.
      b. Interior Storefront: Apogee Enterprises/EFCO, LLC Series 402 Flush Glazed Non-Thermal Screw Spline Storefront with glazing adaptors.
      c. Exterior Entrance Doors: Apogee Enterprises/EFCO, LLC Series D500 Wide Stile Entry Door.
      d. Interior Entrance Doors: Apogee Enterprises/EFCO, LLC Series D500 Wide Stile Entry Doors.
      e. Near-Zero Sight-Line Operable Vent: Apogee Enterprises/EFCO, LLC WV410.
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Storefront:
         1) Apogee Enterprises, Inc./EFCO Corporation/Wausau Window and Wall Systems: www.efcocorp.com/www.wausauwindow.com
         2) Graham Architectural Products: www.grahamwindows.com
         3) Kawneer North America: www.kawneer.com.
         4) Manko Window Systems, Inc: www.mankowindows.com.
         5) Oldcastle Building Envelope/Vistawall Architectural Products/CRL(C. R. Laurence)/United States Aluminum: www.oldcastlebe.com.
         6) Peerless Products, Inc.: www.peerless-usa.com
         7) YKK AP America Inc: www.ykkap.com.
         8) Trulite Glass and Aluminum Solutions: www.trulite.com
         9) Apogee Enterprises/Tubelite, Inc.: www.tubeliteinc.com.
   3. Near - Zero Sightline Operable Vents: If the storefront manufacturers listed above do not single source zero sightline operable vents then products by other manufacturers (listed below) may be considered, provided the warranty, deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Winco Window - 1150SF Series; 2 inch Heavy Commercial Near -Zero Sightline Thermally Improved Vent: www.wincowindow.com
      b. DeSCo Architectural, Inc.: www.descoarch.com
   4. Infill Panels: If the storefront manufacturers listed above do not single source infill panels then products by other manufacturers (listed below) may be considered, provided the warranty, deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:

a. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
   1) Mapes Panels, LLC - Mapes-R Panel : www.mapes.com
b. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
   1) Nudo: www.nudo.com
   2) Manufacturer submitted prior to the issuance of the last addendum.

2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Position: Centered (front to back).
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
   3. Air Infiltration Test Pressure Differential: 1.57 psf.
   4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   8. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements:
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
   3. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
   4. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
   5. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E283.
   6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

1. Framing members for interior applications need not be thermally broken.
2. Glazing Stops: Flush.
3. Sill Flashing End Dams: Insall and seal aluminum end dams at each end of sill flashing. Do not splice below a vertical mullion. Seal all splices.
4. Water Diverters: Provide at all vertical members and glazing pockets. Seal in place.
5. Snap-In Filler: Provide snap-in back of jamb and head members closure piece.

B. Doors: Glazed aluminum, wide stile.
1. Thickness: 1-3/4 inches.
2. Top Rail: 5 inches wide, minimum.
3. Vertical Stiles: 5 inches wide, minimum.
4. Mid Rail: 6 inches wide, 5 inches minimum.
5. Bottom Rail: 10 inches wide, minimum.
6. Glazing Stops: Square.
   a. Exterior Glazed Lights: Non-removable stops on non-secure side. Glazing pocket to accept a 7/8 inch total thickness insulated unit. Size stops in accordance with specified glass thickness. Refer to section 088000 - Glazing for glass requirements.
   b. Interior Glazed Lights: Non-removable stops on non-secure side. Size stops and glazing pocket to accept 1/4 inch glass thickness. Refer to section 088000 - Glazing for glass requirements.
7. Finish: Same as storefront framing.

C. Zero Sightline Operable Vent/Sash: Aluminum project-out awning; finished to match storefront; turn handle latch.
1. All aluminum components to be extrusions fabricated from aluminum alloy 6063-T6, manufactured within commercial tolerances and free from defects impairing strength and/or durability.
2. All aluminum horizontal components shall be fabricated to have a minimum wall thickness of 0.063 inch to a maximum of 0.125 inch.
3. Depth of main frame shall not be less than 2 inch.
4. Depth of vent shall not be less than 3-1/4 inch.
5. Each corner shall be mitered and assembly by means of double corner keys and hydraulically swedged. Seal all joints with sealant.
6. Vent/Sash shall present a flush and zero to near-zero sightline condition on the exterior when closed.
   a. Overlap sash or exposed framing is not acceptable.
7. Operable Sash Weatherstripping: wool pile; permanently resilient, profiled to achieve effective weather seal.

D. Insect Screen Frame: Rolled aluminum frame of rectangular sections; fit with adjustable hardware; nominal size similar to operable glazed unit.
1. Insect Screens: Woven aluminum mesh; 14/18 mesh size.
2. Screen Clips: Four screen clips total, two per side.
   a. Screen mounting holes shall be pre-drilled at the factory.
3. Operable Hardware Access: Provide top hinged wicket at each turn handle.

E. Sill Receptor, Sill Subframe and Sill Extension: Receptors, subframes and extensions are required for all exterior aluminum storefront system whether specifically shown/detailed on the architectural storefront details or required by the manufacturer to meet the aluminum storefront system warranty.
1. General: Receptors, extensions and subframes to be an extruded, thermally broken, aluminum, receiver type sill receptor or subframe with a minimum thickness of .063" as indicated on the drawings. Extensions to be extruded aluminum with a minimum thickness of .063" depth as indicated on the drawings. Assembly shall not require the use of exposed fasteners or rivets. All exposed to view edges shall be hemmed. Color and finish to match aluminum storefront frame.

2. Sill Receptor: Set receptor in a continuous bed of sealant to insure watertight seal with exterior wall components. Sill receptor shall return up the back of the storefront sill in the interior of the room and be one continuous piece the full depth of the storefront sill. Outside edge of sill receptor to have built-in drip edge. Provide receptor in one continuous piece the full width of the storefront opening. If storefront opening width exceeds the limits for one continuous piece receptor then provide a splice joint sealed with 4" wide, self-adhering flashing tape and sealant to provide a watertight splice per manufacturers requirements. Provide receptor with mechanically attached, end dams/caps that have been sealed with a self-adhering sheet product or sealant to provide a watertight condition.
   a. Basis of Design:Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      1) Sill Receptor: EFCO Corporation: 2G90 thermally broken sill receptor: www.efcocorp.com.
      2) Self-Adhering Flashing Tape: W. R. Grace; Perma-Barrier Tape (EFCO Corporation; #WM01)
3. Sill Extension: Slope for positive wash. Extension to attach to receptor without the need for exposed mechanical attachment or additional sealant. Extension to extend over the edge of the exterior veneer with a formed drip edge. Extension model number provided as the basis of design is for shape and basic design intent. Supplier/installer is to verify exact length of extension(s) required from the architectural storefront sill details. Distance of exterior face of storefront frame from the face of the exterior wall veneer may vary depending on exterior wall thickness and conditions.
   a. Basis of Design:Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      1) Sill Extension: EFCO Corporation: _____ sill extension: www.efcocorp.com.
4. Sill Subframe: Provide subframe, in addition to the sill receptor, at areas where the storefront is sitting on the interior concrete slab with flush exterior hard surface. Set subframe in a continuous bed of sealant to insure watertight seal with floor surface. Provide subframe in one continuous piece the full width of the storefront opening. If storefront opening width exceeds the limits for one continuous piece subframe then provide a splice joint sealed with 4" wide, self-adhering flashing tape and sealant to provide a watertight splice per manufacturers requirements. Provide subframe with mechanically attached, end dams/caps that have been sealed with a self-adhering sheet product or sealant to provide a watertight condition.
   a. Basis of Design:Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      1) Sill Subframe - EFCO: 1G64 thermally broken sill subframe: www.efcocorp.com
      2) Self-Adhering Flashing Tape: W. R. Grace; Perma-Barrier Tape (EFCO Corporation; #WM01)
5. No field or shop fabricated brake metal sill receptors, subframes or extensions will be accepted.

F. Infill Panels
1. Laminated, sealed, insulated, faced panels.
2. Thickness: 1".
3. Exterior Finish: Ceramic-coated, heat strengthened, spandrel glass.
   a. Color as selected by Architect from manufacturers standard color selection.
4. Interior Finish Substrate: Tempered hardboard.
5. Interior Finish: Class I Clear Anodized Aluminum.
6. Interior Finish texture: Smooth.
7. Panel Core: 1.7 lb high density isocyanurate.

2.04 MATERIALS

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

B. Sheet Aluminum for Brake Metal: ASTM B209 (ASTM B209M). Minimum 0.040 gauge thickness. Prefinished sheet in color and gloss to match adjacent framing. Joints between brake metal and metal framing to be "hairline" in width. Provide "Z" clips to secure brake metal to metal framing. Provide sealant in all hairline joints, color to match adjacent framing color.

C. Fasteners: Stainless steel.

D. Perimeter Sealant: Type as specified in Section 079005.

E. Glass: As specified in Section 088000.

F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.06 HARDWARE

A. Other Door Hardware: As specified in Section 087100.

B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

D. Operable Vent Operator: Locking handles shall be cam type lever action handle, with US25D brushed finish, fitted to projecting 4-bar stainless steel sash arms.

E. Operable Vent Limit Stops: Vandal resistant, manufacturer standard non-removable aluminum block limit stops with maximum outswing of 8" projection.
   1. Provide on all first floor classsroom windows.

2.07 FABRICATION

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

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

E. Arrange fasteners and attachments to conceal from view.

F. Reinforce components internally for door hardware .

G. Reinforce framing members for imposed loads.

H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.
   1. Install perimeter expandable spray foam insulation between exterior veneer/substrate and wood storefront anchorage blocking at frame surround to prevent wall cavity air from infiltrating the back side of the storefront framing.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier materials.

I. Provide expandable foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Install operating sash.

K. Set thresholds in bed of sealant and secure.

L. Install glass and infill panels in accordance with Section 088000, using glazing method required to achieve performance criteria.

M. Install perimeter sealant in accordance with Section 079005.

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

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

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

3.04 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

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

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

END OF SECTION 084313

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Commercial door hardware for the following swinging doors:
   a. Aluminum.
   b. Hollow metal.
   c. Flush wood.
   d. Existing frames.
2. Key cylinders for doors specified in other Sections.
3. **Electrified access control door hardware. See Door Hardware Schedule and Door-Set Numbering Index (this Section) for hardware sets prefixed with "E". See electrical specifications for additional electrical work and materials required.**
4. **Magnetic door holders:**
   a. Furnished by Contract Hardware Supplier.
   b. Wall-portion installed by fire alarm contractor.
   c. Door-portion installed by hardware installer.

B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. KENTUCKY BUILDING CODE.

C. Related Sections include the following:

1. Division 08 Section "Hollow Metal Doors and Frames" for astragals provided as part of fire-rated labeled assemblies and for door silencers provided as part of hollow-metal frames.
2. Division 08 Section "Flush Wood Doors" for astragals provided as part of fire-rated labeled assemblies.
3. Division 08 Section "Overhead Coiling Doors" for door hardware provided as part of overhead door assemblies.
4. Division 08 Section "Aluminum-Framed Entrances and Storefronts" for weather seals and thresholds provided as part of aluminum-framed entrance and storefront assemblies.
5. Division 26 Sections for connections to electrical power system and for low-voltage wiring work.
6. Division 28 Section "Access Control" for access control readers and controllers installed at door openings and provided as part of a security access system.

1.2 SUBMITTALS

A. Number of Submittals: All items listed in this section are to be included in one submittal prepared by one Supplier.

B. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: Details of electrified door hardware, indicating the following:

1. **Factory-drawn Wiring Diagrams: Hardware submittals without these diagrams will be rejected without review. Power, signal, and control wiring. Include the following:**
   - **a. System schematic.**
   - **b. Point-to-point wiring diagram identifying specific termination points for all electrified hardware items.**
   - **c. Riser diagrams indicating number of conductors and wire gauges required.**
   - **d. Elevation of each door indicating where items are located with respect to which side of opening, dimension above floor, and lateral and vertical distances from opening.**
   - **e. Product schematics.**
2. Detail interface between electrified door hardware and access control system.
3. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

D. Samples for Initial Selection: For each finish, color, and texture required for each type of door hardware as requested by Architect.

E. Samples for Verification: For exposed door hardware of each type, in specified finish, full size, as requested by Architect. Tag with full description for coordination with the door hardware sets. Submit Samples before, or concurrent with, submission of the final door hardware sets.

1. Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

F. Qualification Data:

1. Finish Hardware Installers
   - a. Finish hardware, including electrified hardware, for wood, hollow metal, and aluminum doors to be installed by personnel trained and certified by the manufacturer of the product furnished.
   - b. Provide manufacturer's certificates for installer as part of Contractor's bid information. Failure to supply certificates may result in rejection of bid.
2. Hardware Supplier
   - a. Established contract hardware firm which maintains and operates an office, display, and stock in project area and which is a factory authorized distributor of the lock being furnished.
   - b. Hardware scheduled and furnished by or under direct supervision an Architectural Hardware Consultant.
   - c. All schedules submitted to the Architect for approval and job use must carry the signature and certified seal of this Architectural Hardware Consultant.
3. Architectural Hardware Consultant
   - a. Currently certified by the Door and Hardware Institute.
   - b. Full-time employee of the Hardware Supplier or an individual having no contractual ties to any supplier/manufacturer entity.
   - c. Available at reasonable times to Architect, Owner, and Contractor during course of work.

G. Maintenance Data: For each type of door hardware. Include final hardware schedule, keying schedule, riser diagrams, and point-to-point wiring diagrams in 3-ring binder, labeled on spine with project name and "Door Hardware".

H. Warranty: Special warranty specified in this Section.

I. Other Action Submittals:

1. Door Hardware Sets: Prepared by or under the supervision of a DHI certified Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule"; other formats will be rejected without review. Double space entries, and number and date each page.

b. Numerical Sequence of Sets and Headings: Submittal headings shall be in exact order as hardware sets in specification: one heading only per set. Submittal set numbers shall relate to specification set numbers, ie. if three headings are required for Set 12 due to door width differences, then the heading numbers should be 12.1, 12.2, and 12.3 or employing similar linking logic.

c. Door Numbers: Identical to those used in the contract documents.

d. Number of Copies: (5).

e. Content: Include the following information:

1) Identification number, location, hand, fire rating, and material of each door and frame.
2) Type, style, function, size, quantity, and finish of each door hardware item.
3) Complete designations of every item required for each door or opening including name and manufacturer.
4) Degree of opening for closer and overhead stop and holder installation.
5) Keying information.
6) Fastenings and other pertinent information.
7) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
8) Explanation of abbreviations, symbols, and codes contained in schedule.
9) Mounting locations for door hardware.
10) Notes included with specification hardware sets <u>transcribed verbatim</u> into submittal hardware sets.
11) Door and frame sizes and materials.
12) Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
    a) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
13) List of related door devices specified in other Sections for each door and frame.

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

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

1.3 QUALITY ASSURANCE

A. Furnish proper hardware types and quantities for door function, hardware mounting and clearances, and to meet applicable codes. Bring discrepancies to the attention of the Architect a minimum of (10) days prior to bid date so that an addendum may be issued. No additional compensation will be allowed after bidding for hardware changes required for proper function, hardware mounting or clearances, or to meet codes.

B. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

C. Source Limitations: **All items listed in hardware sets are to be furnished by one supplier**. Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    b. Door Closers: Comply with the following maximum opening-force requirements indicated:
        1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
        2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
3. NFPA 101: Comply with the following for means of egress doors:
    a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    b. Thresholds: Not more than 1/2 inch high.
4. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
    a. Test Pressure: Positive pressure labeling.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

G. Access Control Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Conference is to include representatives of the Owner, Architect, Contractor, CM if applicable, and Access Control (or Security) Supplier. Access control conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future access control system expansion.
3. Requirements for access control storage of credentials and software.
4. Assignment and distribution of permanent access control credentials, badging equipment, and software.
5. Access control privilege assignments including doors, time schedules, users, user groups, special credential functions, etc.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), Systems Integrator(s), and Contractor(s) to review proper methods and procedures for receiving, handling, and installing door and access control hardware to manufacturer's recommendations and according to specifications.

1. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting on the proper installation and adjustment of their respective products. Product training to be attended by the installers of standard and access control door hardware for the aluminum, hollow metal and wood door sections. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures.

1.4 DELIVERY, STORAGE, AND HANDLING

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

B. Deliver hardware for aluminum doors to GC in timely manner so as not to delay fabrication of aluminum doors and frames. Balance of hardware may be delivered to GC at same time, packaged separately from aluminum door hardware, and may be billed as stored materials.

C. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

D. Deliver keys to Owner by registered mail or overnight package service. Obtain Owner’s contact name and address from Architect.

1.5 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Distribute templates in a timely manner so as not to delay suppliers.

Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

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

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

1.6 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for extra heavy duty cylindrical (bored) locks and latches.
2. Five years for exit hardware.
3. Ten years for manual door closers.
4. Two years for electromechanical and integrated access control door hardware.
5. Five years for motorized electric latch retraction exit devices.

1.7 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide (6) months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies same as those used in the manufacture and installation of original products.

1.8 EXTRA MATERIALS

A. Furnish full-size units of door hardware described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Door Hardware:
   a. (2) complete closers (heavy duty parallel arm)
   b. (2) storeroom locksets
   c. (5) rim key cylinders
   d. (5) mortise key cylinders

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this and door hardware sets indicated in Part 3 "Door Hardware Sets" Article.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.

B. Designations: Requirements for design, grade, function, material, finish, size and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
2. References to BHMA Standards: In addition to other requirements in this section, provide products complying with or exceeding these standards and requirements for description, quality, and function.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electrified access control door hardware, in compliance with specifications, must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01 "Substitution Procedures". Approval of requests is at the discretion of the architect, owner, and their designated consultants.

D. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include manufacturers specified.

2.2 BUTT HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).

4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

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

C. Hinge Height, Width, and Weight: Unless otherwise indicated, provide the following:

1. Doors with Exit Devices or 3’6” or more in width: 5” high, heavy-weight hinges.
2. Doors less than 3’6” in width: 4-1/2” high, standard-weight hinges.
3. Width: 4-1/2” heavy-weight, 4" standard-weight, unless proper clearance requires a different width.
4. Doors with Closers: Antifriction-bearing hinges.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Exterior and in-swinging restroom door hinges: Stainless steel, with stainless-steel pin.
2. Balance of hinges: Steel, with steel pin.

E. Hinge Options: Provide the following:

1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for reverse bevel lockable doors.
2. Corners: Square.
3. Number of knuckles: Three.

F. Electrified Functions for Hinges: Comply with the following:

1. Power Transfer: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle.
2. Monitoring: Concealed electrical monitoring switch.
3. Power Transfer and Monitoring: Concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle, and with concealed electrical monitoring switch.

G. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head. Finish screw heads to match surface of hinges.

H. Template Hinge Dimensions: BHMA A156.7.

I. Available Manufacturers:

1. Hager Companies (HAG).
2. McKinney Products Company; an ASSA ABLOY Group company (MCK).
3. Stanley Commercial Hardware; Div. of The Stanley Works (STA).
4. PBB, Inc. (PBB)

2.3 CONTINUOUS HINGES

A. Provide hinge of general series as indicated in hardware sets and of proper shape and model to suit door and frame configuration.

B. Continuous, Pinless-Type Hinges: Extruded-aluminum, pinless, hinge leaves; with concealed, self-lubricating thrust bearings.

1. Available Manufacturers:

a. Hager Companies (HAG).
b. IVES Hardware; an Allegion Company (IVE).
c. McKinney Products Company; an ASSA ABLOY Group company (MCK).
d. Architectural Builders Hardware (ABH).
e. Pemko Manufacturing Co. (PEM).
f. Select Products Limited (SPL).
g. Stanley Commercial Hardware; Div. of The Stanley Works (STA).
h. Zero International (ZRO).

2.4 ELECTRIC STRIKES

A. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Acceptable Manufacturers:

a. HES (HES) - 1006 Series.
b. Security Door Controls (SDC) - 55 Series.
c. Von Duprin (VON) - 6000 Series.
d. Trine (TRN) - 4100 series.
e. Camden (CAM).

B. Surface Mounted Rim Panic Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation.

1. Acceptable Manufacturers:

a. HES (HES) - 9500/9600 Series.
b. Trine (TRN) - 4850 Series.
c. Von Duprin (VON) - 6300 Series.
d. Security Rim Security Door Controls (SDC) - 30 Series.
e. Camden (CAM).

C. Provide electric strikes with in-line (MOV) surge suppressors.

2.5 ELECTRONIC ACCESSORIES

A. Push-Button Switches: Industrial grade momentary or alternate contact, back-lighted push buttons with stainless-steel switch enclosures. 12/24 VDC bi-color illumination suitable for either flush or surface mounting.

1. Acceptable Manufacturers:

a. Security Door Controls (SDC).
b. Securitron Door Controls (SEC).
c. Architectural Control Systems (ACS).
d. Dortronics (DOR).
e. Architectural Control Systems (ACS).

B. Door Position Switches: Pop-in door position magnetic reed contact switches specifically designed for use in commercial door applications. Screw adjustable for door / frame gap. DPDT contacts as specified.

1. Acceptable Manufacturers:

a. Flair Electronics (FLR).

C. Electronic Power Transfers:

1. Concealed: For new doors and frames, concealed when door is closed. All metal construction, cast housing with steel backboxes, two universal joints and rigid tubing. Acceptable Manufacturers:

a. Security Door Controls (SDC).
b. Securitron Door Controls (SEC).
c. Architectural Builders Hardware (ABH).
d. Hager (HAG).
e. Von Duprin (VON).
f. George Risk Industries (GRI).

2.6 LOCKS AND LATCHES, GENERAL

A. Accessibility Requirements: Where indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

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

C. Lock Trim:

1. Levers: Cast.
a. Best 15D model with angled return.

2. Roses: Forged.
   a. Best D model.
3. Dummy Trim: Match lever lock trim and roses.
4. Lockset Designs: Provide design indicated in hardware sets, or, if sets are provided by another manufacturer, provide designs that match those designated.

D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
2. Deadbolts: Minimum 1-inch (25-mm) bolt throw.

E. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

F. Strikes: Manufacturer's standard strike with strike box for each latchbolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, and as follows:

1. Strikes for Bored Locks and Latches: BHMA A156.2.
2. Strikes for Auxiliary Deadlocks: BHMA A156.5.

2.7 MECHANICAL LOCKS AND LATCHES

A. Lock Types: Provide mortise or bored locks as indicated by model number in the Hardware Schedule.

B. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:

1. Bored Locks: BHMA A156.2.

C. Bored Locks: BHMA A156.2 Grade 1.

1. Available Manufacturers:

   a. Best Access Systems; Div. of The Stanley Works (BAS).
   b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (C-R).
   c. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR).
   d. Schlage Commercial Lock Division; an Allegion Company (SCH).
   e. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

D. Compatibility with Key Cylinders: fully warranted for use with key cylinder furnished.

2.8 AUXILIARY LOCKS AND LATCHES

A. Auxiliary Locks: BHMA A156.5, Grade 1.

1. Available Manufacturers:

   a. Best Access Systems; Div. of The Stanley Works (BAS).
   b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (C-R).
   c. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR).
   d. Schlage Commercial Lock Division; an Allegion Company (SCH).
   e. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.9 DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Mortise Flush Bolts: Minimum 3/4-inch (19-mm) throw.

B. Manual Flush Bolts: BHMA A156.16, Grade 1; designed for mortising into door edge.

1. Available Manufacturers:

a. Door Controls International (DCI).
b. Glynn-Johnson; an Allegion Company (GLY).
c. Hager Companies (HAG).
d. IVES Hardware; an Allegion Company (IVE).
e. McKinney Products Company; an ASSA ABLOY Group company (MCK).
f. Rockwood Manufacturing Company (ROC).
g. Trimco (TRI).

2.10 EXIT DEVICES

A. Exit Devices: BHMA A156.3, Grade 1.

B. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

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

D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

E. Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

F. Removable Mullions

1. BHMA A156.3.
2. Key removable.
3. Provide head cap spacers, angle brackets, and other mounting accessories as needed for proper mounting, and anchoring and support of screws, as needed for top jamb configuration.
4. Provide mullion stabilizer sets for mullions at exterior openings.

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

1. Operation: Rigid.

H. Outside Trim: As specified in hardware sets; material and finish to match locksets, unless otherwise indicated.

1. Match design for locksets and latchsets, unless otherwise indicated.

I. Fasteners. Manufacturer's standard, except furnish sex bolts for attachments to doors.

J. Shims: Provide shims if needed for clearance.

K. Available Manufacturers:

1. Detex, Inc. (DTX)
2. Precision Hardware, Inc. (PHI).
3. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR).
4. Von Duprin; an Allegion Company (VON).

2.11 KEY CYLINDERS

A. Standard Lock Cylinders: BHMA A156.5, Grade 1.

B. Cylinders: Provide cylinders for all devices requiring key cylinders to properly function: constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:

1. Number of Pins: Six or seven as directed by Owner.
2. Keyway: Patented or non-patented as directed by Owner.
3. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
4. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
5. Bored-Lock Type: Cylinders with tailpieces to suit locks.

C. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

1. Small-format Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Construction Keying: Comply with the following:

1. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 6 construction master keys.
2. Construction Cores: Provide construction cores that are replaceable by permanent cores for locking devices on exterior doors plus (4) extra. Provide 6 construction master keys.

a. Replace construction cores with permanent cores as directed by Owner.
b. Furnish permanent cores to Owner for installation.

E. Supplemental Items: Provide cylinder spacers, collars, and correct cams as needed for proper function of locking devices.

F. Available Manufacturers:

1. Best Access Systems; Div. of The Stanley Works (BAS).

2. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (C-R).
3. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR).
4. Schlage Commercial Lock Division; an Allegion Company (SCH).
5. Yale Commercial Locks and Hardware; an ASSA ABLOY Group company (YAL).

2.12 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference, and as follows:

1. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE."

2. Quantity: Provide the following:

a. Cylinder Change Keys: Three per cylinder.
b. Master Keys: Six per master.
c. Grand Master Keys: Six.
d. Great-Grand Master Keys: Five.
e. Control Keys: Two.
f. Construction Control Keys: Two.
g. Blanks: One hundred.

2.13 KEY CONTROL SYSTEM

A. Key Control Cabinet: BHMA A156.5, Grade 1; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

1. Wall-Mounted Cabinet: Cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
2. Locate and mount per direction of Architect.

B. Cross-Index System: Multiple-index system for recording key information. Include three receipt forms for each key-holding hook.

1. Available Manufacturers:

a. Lund Equipment Co., Inc. (LUN).
b. MMF Industries (MMF).
c. Telkee; a division of Sunroc Corporation (TEL).

C. Key Control Software: Provide Owner with (1) copy of key control software (basis of design: Medeco Key Wizard)

1. Available Manufacturers:

    a. Best (BES).
    b. Corbin-Russwin (C-R).
    c. Medeco (MED).
    d. Schlage (SCH).

2.14 FIRE DEPARTMENT KEY BOX

A. Provide (1) fully recessed hinged fire department key box.

1. Basis of specification: Knox-Box Model 3200 x RMK x Aluminization x Black.
2. Available Manufacturers:
    a. Knox Company.
    b. Approved equal.

B. Locate in exterior wall as directed by Architect.

2.15 OPERATING TRIM

A. Materials: Fabricate from stainless steel, unless otherwise indicated.

B. Dimensions: All dimensions, shapes, fasteners, and other properties identical to models specified in hardware sets.

C. Push Plates:

1. 0.125" thick, Type 304 solid stainless steel, 4" or 8" wide as indicated by model number in hardware sets, 16" high (unless stile width requires different width), heavy bevel all (4) edges, 3/8" radius rounded corners, factory prepped for key cylinders and thumb-turns as required.
2. Dimensions:
    a. Top of plate to horizontal centerline of key cylinder: 5".
    b. Horizontal centerline of key cylinder to horizontal centerline of thumb-turn: as required per dimension of lock model.
    c. Lock-side edge of plate to vertical centerline of key cylinder: 2".

D. Pull Plates:

1. Plate: 0.050" thick, 4" wide x 16" high (unless stile width requires different width), bevel all (4) edges, 3/8" radius rounded corners, factory prepped for key cylinders and thumb-turns as required.
2. Grip: 1" wide, 8" CTC, Type 304 solid stainless steel, half-moon profile.
3. Dimensions:
    a. Top of plate to horizontal centerline of key cylinder: 2".
    b. Horizontal centerline of key cylinder to horizontal centerline of thumb-turn: as required per dimension of lock model.
    c. Edge of plate to vertical centerline of key cylinder and grip: 2".
    d. Top of plate to horizontal centerline of grip: 10".

E. Available Manufacturers:

1. Hager Companies (HAG).
2. Hiawatha (HIW).

3. Burns (BRN).
4. IVES Hardware; an Allegion Company (IVE).
5. Rockwood Manufacturing Company (ROC).
6. Trimco (TRI).

2.16 SURFACE CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

C. Fasteners: Manufacturer’s standard for arms, shoes and brackets. Sex bolts for fastening closers to doors.

D. Mounting Accessories: Provide shoes, brackets, drop plates, spacers, etc., as needed for proper mounting of closers and arms to door and frame.

E. Spring Size of Units: Provide field-sizable closers, adjustable for spring sizes 1-6, plus 50% extra spring power at spring size 6, to meet field conditions and requirements for opening force.

F. Cylinders: 1-1/2" minimum diameter; cast iron or high-silicon alloy aluminum.

G. Mounting Configuration: Unless otherwise indicated by model number in the hardware sets:

1. Do not furnish closers capable of being mounted on the corridor side of doors.
2. Do not furnish regular arm closers in areas accessible to students.
3. If tri-pack closers are furnished for regular arm applications, remove parallel arm shoe from closer box before delivering to job.
4. Parallel Arm closers are to be manufacturer's double forged rigid models.

H. Available Manufacturers and Series for Rack and Pinion Surface Closers:

1. LCN Closers; an Allegion Company (LCN): 4040XP series.
2. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR): 281 or 351 series.
3. Stanley Commercial Hardware; Div. of The Stanley Works (STA): D4550 series.
4. Corbin-Russwin: DC8000 series.

2.17 PROTECTIVE TRIM UNITS

A. Size:
1. Width
a. Singles, and pairs with removable mullions or surface applied astragals: 2 inches (38 mm) less than door width on push side and 1 inch (13 mm) less than door width on pull side

b. Other pairs: 1 inch (13 mm) less than door width
2. Height: as specified in door hardware sets; or, if constrained by door bottom rail height, 1" less bottom rail height.

B. Fasteners: Manufacturer's machine or self-tapping countersunk screws.

C. Metal Protective Trim Units: BHMA A156.6; beveled 4 sides; fabricated from 0.050-inch- (1.3-mm-) thick stainless steel.

D. Available Manufacturers:

1. Hager Companies (HAG).
2. IVES Hardware; an Allegion Company (IVE).
3. Hiawatha (HIW).
4. Burns (BRN).
5. Rockwood Manufacturing Company (ROC).
6. Trimco (TRI).

2.18 MECHANICAL WALL AND FLOOR STOPS AND HOLDERS

A. Stops and Bumpers: BHMA A156.16, Grade 1.

1. Provide wall stops for doors unless floor, overhead, or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Provide floor stops (and spacers if needed) of proper height and configuration to accommodate floor condition. Where floor or wall stops are not appropriate, provide overhead holders.
2. Properties. Cast construction with fastener suitable for wall or floor condition.
3. Available Manufacturers:
   a. Hager Companies (HAG).
   b. IVES Hardware; an Allegion Company (IVE).
   c. Hiawatha (HIW).
   d. Burns (BRN).
   e. Rockwood Manufacturing Company (ROC).
   f. Trimco (TRI).

B. Wall and Floor mounted Combination Door Stops and Holders: BHMA A156.16, Grade 1.

1. Properties: Heavy cast with adjustable holding force, self-compensating for changes up to ¼" in vertical door position. **Provide flush spacers finished to match adjoining substrates for clearance as needed.**
2. Manufacturer and Model: Trimco 1283.

2.19 OVERHEAD STOPS AND HOLDERS

A. BHMA A156.8, Grade 1. Template for maximum degree of opening before encountering obstruction.

B. Available Manufacturers:

1. Architectural Builders Hardware Mfg., Inc. (ABH).
2. Glynn-Johnson; an Allegion Company (GLY).
3. Hager (HAG).
4. Rixson Specialty Door Controls; an ASSA ABLOY Group company (RIX).
5. SARGENT Manufacturing Company; an ASSA ABLOY Group company (SAR).

2.20 ELECTROMAGNETIC DOOR HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button. **All metal covers**.

B. Accessories: Provide holders of proper configuration for wall and clearance conditions. Provide extension rods as required for proper clearance and engagement.

C. Available Manufacturers:

1. Architectural Builders Hardware Mfg., Inc. (ABH).
2. Hager (HAG).
3. Edwards (EDW).

2.21 SILENCERS

A. Provide silencers for Metal Door Frames, even though they are not listed in the hardware sets: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

B. Available Manufacturers:

1. Glynn-Johnson; an Allegion Company (GLY).
2. Hager Companies (HAG).
3. IVES Hardware; an Allegion Company (IVE).
4. McKinney Products Company; an ASSA ABLOY Group company (MCK).
5. Rockwood Manufacturing Company (ROC).
6. Trimco (TRI).

2.22 DOOR GASKETING

A. General: Provide continuous weather-strip gasketing on exterior hollow metal doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners as indicated by models in hardware sets.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. If hardware is to be attached to the frame and would interfere with the gasketing, then provide hardware compatible gasketing that does not need to be cut for the mounting of hardware.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Mullion Gasketing: Fasten to mullions, forming seal when doors are closed.
4. Sweeps: Apply to bottom of in-swinging exterior hollow metal doors, or as required for sound attenuation, forming seal with threshold or floor when door is closed.
5. Seals integral to threshold at out-swinging exterior hollow metal doors.

B. Requirements per type of rated door provided (these requirements supersede models indicated in hardware sets):

1. Category A wood doors: provide models indicated in hardware sets.
2. Category B wood doors: provide Category G&H seals at jambs and meeting edges. If Category H seals are indicated in hardware sets, provide Cat G seals in addition to the Category H seals.
3. Category A and B hollow metal doors: provide models indicated in hardware sets.

C. Air Leakage: Not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

D. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.

1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.

E. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 or UBC Standard 7-2.

1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches (1016 mm) or less above the sill.

F. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

G. Mullion Gasketing: Sealing up to 1/4" gaps, 4 vanes, adhesive backed, collapsible to 1/32", black. Basis of Design: DHSI (DHS) Model MS-SA/75 x BK.

H. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

I. Jamb Gasketing Materials:
1. Adhesive Seals. As specified in hardware sets or approved equal.
2. Intumescents: As required.
3. Screwed-on weatherstrip and sweeps. Neoprene.
4. Panic type thresholds. Neoprene.

J. Available Manufacturers for Jamb Gaskets (provided they provide items with neoprene inserts):

1. Hager Companies (HAG).
2. National Guard Products (NGP).
3. Pemko Manufacturing Co. (PEM).
4. Reese Enterprises (REE).
5. Zero International (ZER).
6. Legacy Manufacturing (LEG).

2.23 THRESHOLDS

A. Standard: BHMA A156.21

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.

D. Fasteners: ¼-20 machine screws and expansion anchors.

E. Gasketing material: At panic-type thresholds: neoprene.

F. Available Manufacturers (provided they provide items with neoprene inserts):

1. Hager Companies (HAG).
2. National Guard Products (NGP).
3. Pemko Manufacturing Co. (PEM).
4. Reese Enterprises (RE).
5. Zero International (ZRO).
6. Legacy Manufacturing (LEG).

2.24 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Manufacturer's standard, except as noted in product sections of this specification. Provide Rivnuts for the fastening of surface-mounted items to existing door frames.

2.25 FINISHES

A. Standard: BHMA A156.18, as indicated in door hardware sets.

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

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

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

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

3.2 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series.

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

B. Wood Doors: Comply with DHI A115-W Series.

3.3 INSTALLATION

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

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Pulls: locate pulls as directed by Architect.
4. Push Plates: Top edge of plate: 53"AFF.
5. Pull Plates: Top edge of plate: 50" AFF. Centerline of Grip: 40" AFF.
6. Key Cylinders for Auxiliary Deadbolts: 48" AFF.

B. Mounting Locations:

1. Floor Stops and Holders: Locate at least 20" out from hinge edge of door for maximum degree of opening before door encounters obstruction.
2. Wall Stops: Locate so that lockset spindle and wall stop share horizontal and vertical centerlines.
3. Wall Stop/Holders: Locate 4" down and in from top lock-edge corner of door w/holder slot at bottom of unit.
4. **Closers and Overhead Stop/Holders: Template and mount closers and overhead stops for maximum degree of opening before door encounters obstruction or so as to interface with specified wall stops and holders. When used with closers, template and locate overhead stops so that closer arm does not fully extend and bottom out. These functionality requirements override any degree of opening information in the specifications or submittals.**

C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule. Document cross-indexing per manufacturer’s instructions.

E. Boxed Power Supplies: Locate power supplies as directed by Architect.

F. Weatherstrip and Gasketing with Metal Retainers: Fit up as needed for neat appearance with no gaps between retainers or bulbs.

G. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants." **Position for complete seal with bottom of doors with no penetration of air or daylight.**

3.4 FIELD QUALITY CONTROL

A. Provide Door Hardware Inspection Services and Field Quality Report as indicated below.

B. Door Hardware Inspection Services

1. Scope
   a. Inspection of all swinging doors and door hardware immediately following completion of installation.
   b. Inspector to furnish a Field Quality Report, itemized per each individual opening, to the Architect within 7 days of the inspection, including:
      1) deficiencies in workmanship and standard industry practices,
      2) use of allowable products,
      3) use of manufacturer recommended fasteners,
      4) compliance with the ADA,
      5) proper door/frame/hardware clearances,
      6) problems related to function, security, aesthetics or maintenance.
2. Inspector Qualifications
      1) Certified Architectural Hardware Consultant.
      2) Entirely independent of the supply side of the project, having no familial or financial relationship with any manufacturer, manufacturer's representative, distributor, installer or supplier used on this project.
      3) Approved by Architect. Go to http://www.dhi.org/ for searchable list of local Architectural Hardware Consultants.
      4) Full member in good standing of Specification Consultants in Independent Practice (SCIP).
      5) Same Inspector for re-inspections as for the initial inspection.
3. Payment for the inspection and subsequent re-inspections until work is complete and approved is to be made directly by the Contractor to the Inspector within 30 days of receipt of report and invoice.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

B. Overhead Stops/Holders: Set adjustable stops for maximum degree of opening before door encounters obstruction. Adjust friction to control door.

C. Wall and Floor Mounted Stop/Holders: Adjust holding force with spanner head wrench so that door is held securely, yet is easy to pull out of hold open.

D. Door Closers:

1. Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
2. Adjust latch period so that door does not slam nor injure fingers.
3. **Adjust spring power for minimum force required so that door properly and reliably latches. It is recommended that all closers be adjusted to a Spring Size 1 (either at the factory or at the facility of the Contract Hardware Supplier) prior to delivery to job; they can then be adjusted up to meet requirements. ADA maximum force to open a non-rated interior doors is 5 lbf; 8.5lbf for an exterior non-rated door. Installer is required to adjust spring power on every closer during installation using a door force gage. If ADA requirements cannot be met due to door-frame-hardware clearance issues of HVAC issues, bring to Contractors attention to resolve problem.**
4. Adjust backcheck to slow door down before hitting stop point so as to prevent damage to closer, arm, door, frame, and fasteners.

E. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer shall examine and readjust, including adjusting operating forces, each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DOOR HARDWARE SCHEDULE

HARDWARE SET PREFIX KEY:
E Indicates Electronic Hardware.
R Indicates retrofit work required.
No prefix indicates mechanical hardware only.

Hardware Set E01

Non-electrified Items:

(2)	Continuous Hinge	SL11HD	628	SEL
(1)	Key Removable Mullion	KR-4954 x 154 x Angle Bracket	689	VON
(2)	Rim Cylinder		613	BES
(2)	SFIC Cylinder Core		626	BES
(1)	Offset Pull	7191-14 x N-MD Mtg	630	TRI
(1)	NS Panic Device, Rim, 01, LD	LD33A-EO	630	VON
(1)	NS Panic Device, Rim, 03, LD	LD33-NL-OP	630	VON
(2)	Closer, w/Spring Stop	4040XP SCUSH x 4040-30 x 4040-61	689	LCN
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	Black	DHSI
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

Note 1: Jamb seals and meeting edge seals by aluminum door supplier.

Electrified Items:

(1)	Electric Strike, Rim Note: Mount on RHR door leaf.	CX-ED1959-MB	630	CAM
(2)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI

(1) Lot: Card reader, control electronics, video-intercom system, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.

System Function:

Free egress. Ingress by key, card, or pushbutton integral to video-intercom. Doors are monitored for door position.

Hardware Set E02

Non-electrified Items:

(2)	Continuous Hinge	SL11HD	628	SEL
(1)	Key Removable Mullion	KR-4954 x 154 x Angle Bracket	689	VON
(2)	Rim Cylinder		613	BES
(2)	SFIC Cylinder Core		626	BES
(1)	Offset Pull	7191-14 x N-MD Mtg	630	TRI
(1)	NS Panic Device, Rim, 01, LD	LD33A-EO	630	VON
(1)	NS Panic Device, Rim, 03, LD	LD33-NL-OP	630	VON
(2)	Closer, w/Spring Stop	4040XP SCUSH x 4040-30 x 4040-61	689	LCN
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	Black	DHSI
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

Note 1: Jamb seals and meeting edge seals by aluminum door supplier.

Electrified Items:

(2)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI

(1) Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.

System Function:

Free egress. Ingress by key. Doors are monitored for door position.

Hardware Set E03

Non-electrified Items:

All hardware by overhead door supplier.

Electrified Items:

(1)	Door Contact, Surface, TB, DPDT GR2707-AD		628	GRI
(1)	Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

System Function:

Door is monitored for door position.

Hardware Set E04

Non-electrified Items:

(6)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Key Removable Mullion	KR-4954 x 154 x Angle Bracket	689	VON
(2)	Rim Cylinder		613	BES
(2)	SFIC Cylinder Core		626	BES
(1)	Panic Device, Rim, 01, LD	LD99EO	630	VON
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(2)	Closer, w/Stop	4040XP CUSH	689	LCN
(2)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	Black	DHSI

Electrified Items:

(1)	Electric Strike, Rim Note: Mount on RHR door leaf.	CX-ED1959-MB	630	CAM
(1)	Pushbutton, Momentary Note: Locate pushbutton in Reception A-100 as directed by Architect.	5236-P15	628	DRT
(1)	Lot: Card reader, control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

System Function:

Free egress. Ingress by key, card, or pushbutton.

Hardware Set E05

Non-electrified Items:

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI

Electrified Items:

(1)	Electric Strike, Cylindrical	CX-ED1079	630	CAM
(1)	Pushbutton, Momentary Note: Locate pushbutton in Reception A-100 as directed by Architect.	5236-P15	628	DRT
(1)	Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

System Function:

Free egress. Ingress by key or pushbutton.

Hardware Set E05A

Non-electrified Items:

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	Double-cylinder Deadbolt	8T3-7-E2141	626	BES
(2)	SFIC Cylinder Core		626	BES
(1)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI

Electrified Items:

(1)	Electric Strike, Cylindrical	CX-ED1079	630	CAM
(1)	Pushbutton, Momentary	5236-P15	628	DRT

Note: Locate pushbutton in Reception A-100 as directed by Architect.

(1) Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.

System Function:

Free ingress to Reception A-100. Egress to Corridor by key or pushbutton. After hours, door is locked with dead-bolt.

Hardware Set ER01

Non-electrified Items:

(1)	Continuous Hinge	SL24HD	628	SEL
(1)	Rim Cylinder		613	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(1)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(1)	Closer Spacer	51875-52250		LEG

Note 1: Do not cut top jamb seal for closer arm bracket. Lower the closer on the door and mount closer shoe to jamb seal. Use spacer for 5th closer screw.

(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Overhead Rain Drip	16A	628	NGP
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	Black	DHSI
(1)	Cat H Jamb Seal Set	5924	628	LEG
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

(3)	Hinge Blank			DonJo
(1)	Strike Blank			DonJo

Electrified Items:

(1)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI

(1) Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.

Retrofit Note:

New door in existing frame. Onsite visit required to verify correct size of hinge blanks and strike blanks. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

System Function:

Free egress. Ingress by key. Door is monitored for door position.

Hardware Set ER02

Non-electrified Items:

(1)	Continuous Hinge	SL24HD	628	SEL
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(1)	Closer Spacer	51875-52250		LEG

Note 1: Do not cut top jamb seal for closer arm bracket. Lower the closer on the door and mount closer shoe to jamb seal. Use spacer for 5th closer screw.

(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Overhead Rain Drip	16A	628	NGP
(1)	Cat H Jamb Seal Set	5924	628	LEG
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

(3)	Hinge Blank			DonJo
(1)	Lock Guard, Cylindrical Lock	1082-6S	630	TRI

Electrified Items:

(1)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI
(1)	Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

Retrofit Note:

New door in existing frame. Onsite visit required to verify correct size of hinge blanks. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

System Function:

Free egress. Ingress by key. Door is monitored for door position.

Hardware Set ER02A

Non-electrified Items:

(2)	Continuous Hinge	SL24HD	628	SEL
(1)	Manual Flush Bolt	3917-12	626	TRI
(1)	Manual Flush Bolt	3917-24 (top)	626	TRI
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(2)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(2)	Closer Spacer	51875-52250		LEG

Note 1: Do not cut top jamb seal for closer arm bracket. Lower the closer on the door and mount closer shoe to jamb seal. Use spacer for 5th closer screw.

(2)	Kick Plate	KO050 8 x 1LDW x CS x B4E	630	TRI
(1)	Overhead Rain Drip	16A	628	NGP
(1)	Cat H Jamb Seal Set	5924	628	LEG
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

(6)	Hinge Blank			DonJo
(1)	Lock Guard, Cylindrical Lock	1082-6S	630	TRI

Note 1: Overlapping steel welded astragal on push side of inactive leaf by door supplier.

Electrified Items:

(1)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI
(1)	Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

Retrofit Note:

New door in existing frame. Onsite visit required to verify correct size of hinge blanks. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

System Function:

Free egress. Ingress by key. Doors are monitored for door position.

Hardware Set ER03

Non-electrified Items:

(6)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(2)	Fire Exit Device, SVR, 14	9927L-F x 996L-BE-R/V-17 x LBR	630	VON
(2)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(2)	Closer Spacer	51875-52250		LEG

Note 1: Do not cut top jamb seal for closer arm bracket. Lower the closer on the door and mount closer shoe to jamb seal. Use spacer for 5th closer screw.

(2)	Kick Plate	KO050 8 x 1LDW x CS x B4E	630	TRI
(1)	Cat H Astragal Set	7574	628	LEG
(1)	Cat H Jamb Seal Set	5924	628	LEG

Electrified Items:

(2)	Magnetic Holder	2100 x Tri-voltage	652	ABH

(1) Lot: Control electronics, fire alarm connection, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.

Retrofit Note:

New door in existing frame. Onsite visit required to verify correct size of hinge and location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

System Function:

Free egress and ingress. Doors are normally held open with magnetic holders. Upon signal from fire alarm, doors close and latch.

Hardware Set ER04

Non-electrified Items:

(2)	Continuous Hinge	SL24HD	628	SEL
(1)	Key Removable Mullion	KR-4954 x 154	689	VON
(1)	Panic Device, Rim, 01, LD	LD99EO	630	VON
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(2)	SFIC Cylinder Core		626	BES
(2)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(2)	Closer Spacer	51875-52250		LEG

Note 1: Do not cut top jamb seal for closer arm bracket. Lower the closer on the door and mount closer shoe to jamb seal. Use spacer for 5th closer screw.

(2)	Kick Plate	KO050 8 x 1LDW x CS x B4E	630	TRI
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	Black	DHSI
(1)	Overhead Rain Drip	16A	628	NGP
(1)	Cat H Jamb Seal Set	5924	628	LEG
(1)	Panic Threshold	356MA x RCE	628	LEG

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

(6)	Hinge Blank			DonJo

Electrified Items:

(1)	Door Contact, ¾", Pop-in, DPDT	195-12	White	GRI
(1)	Lot: Control electronics, low voltage power, low voltage cabling and terminations, and programming: see Electrical Specifications.			

Retrofit Note:

New door in existing frame. Onsite visit required to verify correct size of hinge blanks. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

System Function:

Free egress. Ingress by key. Doors are monitored for door position.

Hardware Set R01

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Office Lock	93K7AB-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R02

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R02A

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, w/Stop	4040XP CUSH	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R02B

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(1)	Kick Plate	KO050 16 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop/Holder w/Shim	1283-6S x (1) Z900-35643.628 1" Shim	628	TRI

Note: Locate in inverted "U" orientation approx. 4" down and in from top lock corner of door.

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R02C

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Overhead Stop, HD, Surface	900S	630	GLY

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R02D

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, Regular Arm	4040XP Reg	689	LCN

Note: Provide special emplating so as not to conflict with overhead stop.

(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Overhead Stop, HD, Concealed	100S x ADJ	630	GLY

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R03

(3)	Butt Hinges	BB1191 4.5 X 4.5	630	HAG
(1)	Privacy Set w/Indicator	ND40 RHO x IS-OCC x OS-OCC	626	SCH
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R04

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R04A

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Overhead Stop, HD, Surface	900S	630	GLY

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R04B

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Overhead Stop, HD, Surface	900S	630	GLY

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R05

(3)	Butt Hinges	BB1191 4.5 X 4.5	630	HAG
(1)	Push Plate	1809-4 x RC x CFC	630	TRI
(1)	Pull Plate	1014-3B x RC x CFC x CFT	630	TRI
(1)	Classroom/Double Cyl Deadbolt	314-1/4ST x Less Cylinders	626	YAL
(2)	Mortise Cylinder		626	BES
(2)	SFIC Cylinder Core		626	BES
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Field prep existing frame to receive new deadbolt strike. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R06

(3)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(1)	Rim Cylinder		626	BES
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R06A

(3)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(1)	Rim Cylinder		626	BES
(1)	Closer, w/Stop/HO	4040XP HCUSH	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set R06B

(3)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Panic Device, Rim, 08, LD	LD99NL x 996L-R/V17	630	VON
(1)	Rim Cylinder		626	BES
(1)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Retrofit Note:

New door in existing frame. Onsite visit required to verify hinge size and location and strike location. Fill all exposed holes in frame from previous hardware in an aesthetically pleasing manner.

Hardware Set 01

(2)	Continuous Hinge	SL11HD	628	SEL
(1)	Key Removable Mullion	KR-4954 x Angle Bracket	689	VON
(2)	Rim Cylinder		613	BES
(2)	Mortise Cylinder		613	BES
(4)	SFIC Cylinder Core		626	BES
(2)	Offset Pull	7191-14 x N-MD Mtg	630	TRI
(1)	NS Panic Device, Rim, 01, CD	CD33A-EO	630	VON
(1)	NS Panic Device, Rim, 03, CD	CD33-NL-OP	630	VON
(2)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(2)	Wall Stop/Holder w/Shim	1283-6S x (1) Z900-35643.628 1" Shim	628	TRI
	Note: Locate in inverted "U" orientation approx. 4" down and in from top lock corner of door.			
(1)	Cat H Adhesive Mullion Seal/Mute MS-SA/75		Black	DHSI

Note 1: Jamb seals and meeting edge seals by aluminum door supplier.

Hardware Set 02

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Hardware Set 02A

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

Hardware Set 02B

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Storeroom Lock	93K7D-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Kick Plate	KO050 16 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop/Holder w/Shim	1283-6S x (1) Z900-35643.628 1" Shim	628	TRI

Note: Locate in inverted "U" orientation approx. 4" down and in from top lock corner of door.

Hardware Set 03

(3)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(1)	Rim Cylinder		613	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, HD Parallel Arm	4040XP EDA	689	LCN
(1)	Kick Plate	KO050 16 x 2LDW x CS x B4E	630	TRI
(1)	Wall Stop/Holder w/Shim	1283-6S x (1) Z900-35643.628 1" Shim	628	TRI

Note: Locate in inverted "U" orientation approx. 4" down and in from top lock corner of door.

Hardware Set 03A

(3)	Butt Hinges	BB1168 5 X 4.5	652	HAG
(1)	Panic Device, Rim, 03, LD	LD99NL x 697NL	630	VON
(1)	Rim Cylinder		613	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Closer, w/Stop	4040XP CUSH	689	LCN
(1)	Kick Plate	KO050 16 x 2LDW x CS x B4E	630	TRI

Hardware Set 04

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Office Lock	93K7AB-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Wall Stop, Convex	1270CX	626	TRI

Hardware Set 05

(3)	Butt Hinges	BB1279 4.5 X 4.5	652	HAG
(1)	Classroom Lock	93K7R-15D-S3	626	BES
(1)	SFIC Cylinder Core		626	BES
(1)	Wall Stop, Convex	1270CX	626	TRI

Hardware Set 06

(3)	Butt Hinges	BB1191 4.5 X 4.5	630	HAG
(1)	Privacy Set w/Indicator	ND40 RHO x IS-OCC x OS-OCC	626	SCH
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Wall Stop, Convex	1270CX	626	TRI

3.8 DOOR TO HARDWARE SET NUMBERING INDEX

Door	HW Set
102	01
103	R02A
104	R04
106	R03
107	R03
108	R01
109	R02
110	R01
111	R02
112	R01
115	R05
116	R05
117	R04
118	R04
119	R02A
120	R04
121.1	R02
121.2	R04A
122.1	R02
122.2	ER02
122.3	R02
123.1	R06A
123.2	E02
123.3	E03
123.4	R04A
124	05
125	R02C
126.1	03A
126.2	03A
128.1	R02
128.2	E03
129	R02B
130	R04B
131.1	R06A
131.2	ER01
132	R02
135.1	R02D
135.2	ER02A
136.1	R06A
136.2	ER01
136.3	E03
137	R02
138	R02
139	R02
140.1	R04A
140.2	ER01
140A	R02A
141.1	R06A
141.2	ER01
141.3	R02
142	R02
143	R02C
145.1	E03
145.2	E03
145.3	E02
146.1	R06A
146.2	R06B
149	R02
150	R02
151	ER04
151A	R02
152.1	R04A
152.2	R02
153.1	R04A
153.2	R02
A-100.1	E05
A-100.2	E05A
A-100A	04
A-100B	05
A-100C	06
A-100D	06
A-101	02
A-102	02
A-103	02
A-104	02
A-105.1	03
A-105.2	03
A-107	02
A-108	02A
A-109	02A
A-110	02B
A-CA	E02
A-VA.1	E01
A-VA.2	E04
CA.1	E01
CB	ER03

END OF SECTION 087100

SECTION 087100.01
FINISH HARDWARE SUPPLIER'S CERTIFICATION

FINISH HARDWARE SUPPLIER'S CERTIFICATION

This certification must be completed and submitted as outlined in the Supplemental Instructions to Bidders. Failure to submit this completed certification may be cause for rejection of the bidder's proposal.

This certification must be completed and submitted within 24 hours after bids are received.

Date Submitted:_____

Name & Address of Finish Hardware Supplier:

_____

_____

_____

I certify that _____ (print or type name of employee) is a current member of the Door and Hardware Institute (DHI), certified by DHI as an Architectural Hardware Consultant. I further certify that this person has fulfilled the educational experience requirements of the DHI's Continuing Education Program for Consultants and is authorized by DHI to use the Official Seal.

All hardware for this project shall be scheduled and furnished by or under direct supervision of the person listed above, who is also a full-time employee of the firm listed above.

DHI Membership Number_____

DHI Official Seal Valid Through_____ (Date)

Signed:_____Title: _____

SECTION 088000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 079005 - Joint Sealers: Sealant and back-up material.

B. Section 081113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 081416 - Flush Wood Doors: Factory glazed doors.

D. Section 084313 - Aluminum-Framed Storefronts: Framing system.

E. Section 102800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1036 - Standard Specification for Flat Glass; 2011.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

G. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

H. GANA (GM) - GANA Glazing Manual; 2009.

I. GANA (SM) - GANA Sealant Manual; 2008.

1.04 SUBMITTALS

A. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
   1. Submit designation of the percentages of post-consumer and pre-consumer recycled-content in glass products.

B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

C. Product Data on Solar Control Coatings: Provide product data on all specified solar control coatings to be provided.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

C. Insulated Glass Fabricator Qualifications: Current, approved member of the Insulating Glass Certification Council (IGCC). Member warrants that its manufactured insulated glass units (IGU) will

correspond in all material respects to the specification and will be free from defects in material and workmanship for ten (10) years from the date of substantial completion.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLASS MATERIALS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include;

B. Glass Manufacturers:
1. Cardinal Glass Industries: www.cardinalcorp.com.
2. AGC Flat Glass North America, Inc: www.na.agc-flatglass.com.
3. Guardian Industries Corp: www.sunguardglass.com.
4. Pilkington North America Inc/NSG Group: www.pilkington.com/na.
5. Vitro Architectural Glass: www.vitroglazings.com.
6. Trulite Glass and Aluminum Solutions: www.trulite.com
7. Zeledyne: www.versaluxglass.com.

C. Float Glass: Provide float glass based glazing unless noted otherwise.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
3. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

D. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
2. Plastic Interlayer:
3. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.

E. Clear Float Glass : Clear, annealed.
1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
2. Comply with ASTM C 1048.

F. Safety Glass : Clear; fully tempered.
1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
2. Comply with 16 CFR 1201 test requirements for Category II.
3. 6 mm minimum thick.
4. Provide this type of glazing in the locations indicated on the drawings.

G. Assault Resistant Glazing/Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
2. 9/16" total thickness, fully tempered with PVB interlayer.
3. Outboard lite: 1/4 inch (6 mm) thick tempered, clear glass.
4. Plastic Interlayer:

a. Polyvinyl Butyral (PVB) Interlayer: 0.090 inch thick, minimum.
1) Color: Clear

5. Inboard lite: 1/4 inch (6 mm) thick tempered, clear glass.

H. Laminated Glass: 9/16" total thickness, fully tempered with PVB interlayer.
1. Outboard lite: 1/4 inch (6 mm) thick tempered, clear glass.
2. Interlayer Thickness: 0.090 inch
3. Interlayer Color: Clear Flat
a. Interlayer to be Vanceva by Solutia or equivalent.
4. Inboard lite: 1/4 inch (6 mm) thick tempered, clear glass.

2.02 SEALED INSULATING GLASS UNITS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
1. Cardinal Glass Industries: www.cardinalcorp.com.
2. Glenny Glass: www.glennygls.com
3. Guardian Industries Corp: www.guardian.com.
4. Louisville Plate Glass: www.louisvilleplateglass.com
5. Oldcastle Building Envelope: www.oldcastlebe.com
6. Trulite Glass and Aluminum Solutions: www.trulite.com
7. Viracon, Apogee Enterprises, Inc: www.viracon.com.

B. Sealed Insulating Glass Units: Types as indicated.
1. Application: Exterior, except as otherwise indicated.
2. Durability: Certified by an independent testing agency to comply with ASTM E2190.
3. Edge Spacers: Aluminum, bent and soldered corners.
4. Edge Seal: Glass to elastomer with supplementary silicone sealant.
5. Purge interpane space with dry hermetic air.

C. Insulated Glass Units : Double pane with glass to elastomer edge seal.
1. Locations: Exterior metal windows, storefront and/or curtainwall window systems.
2. Total unit thickness of 1 inch, minimum.
3. Outer pane of 1/4" glass, inner pane of 1/4" glass.
4. Place low E coating on No.2 surface within the unit.
5. Low-E Coating: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
a. AGC - Energy Select 36
b. Guardian - SN 68
c. Vitro Architectural Glass - Solarban 60

D. Insulated Glass Units : Double pane with glass to elastomer edge seal.
1. Locations: Exterior hollow metal, aluminum storefront and /or curtainwall doors.
2. Total unit thickness of 7/8 inch, minimum.
3. Outer pane of 3/16 glass, inner pane of 3/16 glass.
4. Place low E coating on No.2 surface within the unit.
5. Low-E Coating: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
a. AGC - Energy Select 28
b. Guardian - SN 68
c. Vitro Architectural Glass - Solarban 60

E. Insulated Glass Units : Double pane with glass to elastomer edge seal.
1. Locations: Exterior metal windows, storefront and/or curtainwall window systems.
2. Total unit thickness of 1 inch, minimum.
3. Outer pane (1/2 surface) of 1/4 inch tempered glass, inner pane (3/4 surface) of 9/16 inch assault resistant glass.
4. Place low E coating on No.2 surface within the unit.

5. Low-E Coating: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
   a. AGC - Energy Select 28
   b. Guardian - SN 68
   c. Vitro Architectural Glass - Solarban 60
6. Inner Pane (3/4 Surface): Assault Resistant Glazing/Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   a. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
   b. 9/16" total thickness, fully tempered with PVB interlayer.
      1) Outboard lite: 1/4 inch (6 mm) thick tempered, clear glass.
      2) Plastic Interlayer:
         (a) Polyvinyl Butyral (PVB) Interlayer: 0.090 inch thick, minimum.
         (b) Color: Clear
      3) Inboard lite: 1/4 inch (6 mm) thick tempered, clear glass.

2.03 GLAZING COMPOUNDS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include,

B. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
   3. Pecora Corporation: www.pecora.com.
   4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   5. Substitutions: Refer to Section 016000 - Product Requirements.

C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; standard color.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; hardness range of 5 to 30 cured Shore A durometer; coiled on release paper; black color.
   1. Manufacturers:
      a. Pecora Corporation: www.pecora.com.
      b. Tremco Global Sealants: www.tremcosealants.com.
      c. Substitutions: Refer to Section 016000 - Product Requirements.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; _____ color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 INSTALLATION - EXTERIOR WET METHOD (SEALANT AND SEALANT)

A. Place setting blocks at 1/4 points and install glazing pane or unit.

B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION 088000

FINISH LEGEND		
January 2025	Simpson Co. CTE	RTA #23066

All colors will be selected at a later date in a color board review meeting with the owner. Items listed below are basis of design only. The color board will be created and reviewed when all shop drawings and physical samples are received.

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
	ETR	Existing To Remain			Etr
	EXP	Exposed To Structure			
064100	HPL1	High Pressure Laminate	Mfr.:		Wilson Art
		Reception	Color:		Sap Walnut
			No:		8221-38
			Finish:		Fine Velvet Finish
			Location:		Reception Desk
	HPL2	High Pressure Laminate	Mfr.:		Wilson Art
		Reception	Color:		Lapis Blue
			No:		D417-60
			Finish:		Matte Finish
			Location:		Reception Desk Accent
	HPL3	High Pressure Laminate	Mfr.:		Wilson Art
		Pharmacy Casework	Color:		Phantom Cocoa
			No:		8213K - 28
			Finish:		Fine velvet finish
			Location:		Pharmacy
	HPL4	High Pressure Laminate	Mfr.:		Wilson Art
		Pharmacy Counter Top	Color:		Pewter Mesh
			No:		4878 - 38
			Finish:		Fine velvet finish
			Location:		Pharmacy Countertop
	HPL5	High Pressure Laminate	Mfr.:		Wilson Art
		RestRooms	Color:		Carbon Mesh
			No:		4480 - 38
			Finish:		Fine velvet finish
			Location:		Sink Vanities
	SS1	Solid-Surface	Mfr.:		Wilson Art
		Restroom Counter Top	Color:		9116GS Soothing Grey
			Thickness:		1/2"
			Edge Profile:		Eased
			Location:		Restroom Counter Top
	SS2	Solid-Surface	Mfr.:		Wilson Art
		Reception desk counter top	Color:		Milk Glass Spectra
			Thickness:		1/2"
			Edge Profile:		Eased
			Location:		Reception counter top
	SS3	Solid-Surface	Mfr.:		Wilson Art
		Window Sills	Color:		Milk Glass Spectra
			No:		9077ST
			Thickness:		13 MM
			Edge Profile:		Eased
			Location:		Exterior Windows
	STL1	Stainless Steel Countertop	Mfr.:		TBD
			Location:		Refer to drawings
	STL2	Stainless Steel Wall Cladding	Mfr.:		TBD
			Location:		Refer to drawings
	DCF1	Display Case Tackable Fabric	Mfr:		Guilford of Maine
			Tackable Material Thickness:		1"
			Type:		FR701
			Color:		TBD
			Location:		Display Case Backs
	DC1	Display Case Components	Mfr.:		Knape & Vogt
		Steel Track Assembly	Style:		Steel Track Assembly
			Model:		P992 ZC
			Side Track:		993
			Lock Number:		963 ZC
			Finish:		Zinc

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
			Notes:		Provide Side Tracks 993 and Lock No. 963 ZC
			Location:		Display Cases
	DC2	Display Case Components	Mfr.:		TBD
		Tempered Glass Doors - on track	Style:		Glass Doors
			Notes:		1/4" thick, tempered glass doors
			Location:		Display Cases
	DC3	Display Case Components	Mfr.:		TBD
		Tempered Glass Shelves	Style:		Glass Shelves
			Size:		16"d x 26"w x 1/4" thick (Field verify sizes)
			Notes:		Tempered with polished edge, 9 shelves per display case
			Location:		Display Cases
	DC4	Display Case Components	Mfr.:		Udizine
		Starter Unit	Style:		Floor to Ceiling Cable Kit for 3 Glass Shelves
			Model:		UDI-ASC02-BG3
			Color:		Glass shelves, stainless steel cable with Satin Chrome coating
			Size:		3 shelves high
			Cable:		Stainless Steel 1/16" with Satin Chrome coating
			Notes:		Shelf height spaced evenly
			Qty:		Provide one per display case
			Location:		Display Cases
	DC5	Display Case Components	Mfr.:		Udizine
		Extension Unit	Style:		Floor to Ceiling Cable Kit for 3 Glass Shelves
			Model:		UDI-ASC02-EG3
			Color:		Glass shelves, stainless steel cable with Satin Chrome coating
			Size:		3 shelves high
			Cable:		Stainless Steel 1/16" with Satin Chrome coating
			Notes:		Shelf height spaced evenly
			Qty:		Provide two extension units per display case
			Location:		Display Cases
	DC6	Tempered Glass Doors	Mfr.:		TBD
		Fixed Panel	Style:		Glass Doors
			Notes:		1/4" thick, tempered glass doors
			Location:		Display Cases
			Note:		Because track only comes in multiples of two, one panel of glass shall be fixed next to the track
	PD1	LOW-PROFILE PENCIL DRAWER	MANUFACTURER:		QLINE
			MODEL:		639N-20C
			COLOR:		BLACK
			SIZE:		APPROX 2'-0" WIDE
			LOCATION:		REFER TO DRAWINGS
	SWV1	Solid Wood Veneer	Mfr:		Maple
		Maple Wood Bench Front	Style:		Solid Maple Veneer
			Color:		White Maple
			Finish:		Stained to match designers sample
			Location:		Corridor Bench
072129		Spray On Acoustical	Mfr:		TBD
		Refer to Architectural spec section for moreinformation	Color 1:		TBD
081416	WD1	Wood Veneer Face	Veneer Supplier:		Tbd
		Door	Wood Species:		Tbd
			Hpva Grade:		Aa
			Finish:		Tbd
			Color:		Tbd
			Side Match:		Slip
			Accessories:		Provide One Coat Hook (Sagatsune Dsh-01 Stainless Steel) On Each Door At 5'-0" A.F.F.
			Location:		Typical
			Note:		
092116	FRP1	Fiberglass Reinforced	Mfr.:		Crane Composites
		Panels	Product:		Standard Frp
			Finish:		Smooth/Fsi
			Color:		White (85)
			Location:		Refer To Drawings
093000	CT1	Ceramic Or Porcelain Tile	Mfr.:		Portobello America
		Floor Tile	Style:		Fusion
			Color:		Carbon Nat Bold

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
			Size:		12x24
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Stack Bond
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex--Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Restrooms
	CT2	Ceramic Or Porcelain Tile	Mfr.:		Portobello America
		Field Wall Tile	Style:		Fusion
			Color:		Chalk Nat Bold
			Size:		12x24
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Stack Bond
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex--Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Restrooms
	CT3	Ceramic Tile	Mfr.:		Amerian Olean
		Accent Wall Tile	Style:		Color Story
			Color:		0070 Sapphire Sky
			Size:		4x16
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Custom; refer to drawings
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Behind Water Fountains
	CT4	Ceramic Tile	Mfr.:		Amerian Olean
		Accent Wall Tile	Style:		Color Story
			Color:		0006 Shadow
			Size:		4x16
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Custom; refer to drawings
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Behind Water Fountains
	CT5	Ceramic Tile	Mfr.:		Amerian Olean
		Accent Wall Tile	Style:		Color Story
			Color:		0025 Ice White
			Size:		4x16
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Custom; refer to drawings
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Behind Water Fountains
	CT6	Ceramic Tile	Mfr.:		Amerian Olean
		Accent Wall Tile	Style:		Color Story
			Color:		0014 Balance
			Size:		4x16
			Grout:		Tbd
			Grout Mfr:		TEC Powergrout
			Grout Color:		Tbd
			Installation:		Custom; refer to drawings
			Accessories:	1	Provide Schluter-Quadec Aluminum On All Outside Corners.
				2	Provide Schluter Aluminum Cove Base Profile, -Dilex-AHK At Intersection Of Floor And Wall Tile
			Location:		Behind Water Fountains
095113	APC1	Acoustical Panel Ceiling	Mfr.:		Armstrong
		Typical	Style:		School Zone Fine Fissured
			No.:		1713
			Size:		2'X2'
			Color:		White

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
			Edge:		Square
			Grid:		15/16"
			Location:		Typical
			Note:		All Cut Tile Edges To Be Painted To Match Face Of Tile
	APC2	Acoustical Panel Ceiling	Mfr.:		Armstrong
		Kitchen Zone	Style:		Kitchen Zone
			No.:		673
			Size:		24" X 24" X 3/4"
			Color:		White
			Edge:		Tegular
			Grid:		15/16"(White)
			Location:		Typical
			Note:		All Cut Tile Edges To Be Painted To Match Face Of Tile
	APC3	Acoustical Panel Ceiling	Mfr.:		Armstrong
		Acoustical Cloud Panels	Style:		Feltworks
			No.:		8246
			Size:		48"x96"x1"
			Color:		Up to three colors
			Edge:		Square
			Grid:		Drywall Grid with D40 Magnet attachment
			Grid Color:		To be painted black to match exposed ceiling
			Location:		Multipurpose
			Note:		All Cut Tile Edges To Be Painted To Match Face Of Tile
096500	SVT1	Resilient Tile Flooring:			American Biltrite
		Solid Vinyl Tile - Field	Style:		Texas Granite
			Color:		White/Grey
			Size:		12x12
			Thickness:		2mm
			Adhesive:		Manufacturer's recommended for floor slab conditions. Renovated and new construction may require separate adhesives.
			Installation:		See Drawing
			Location:		See Drawing
	SVT2	Resilient Tile Flooring:	Mfr.:		American Biltrite
		Solid Vinyl Tile	Style:		Texas Granite
			Color:		Primary Blue
			Size:		12x12
			Thickness:		2mm
			Adhesive:		Manufacturer's recommended for floor slab conditions. Renovated and new construction may require separate adhesives.
			Installation:		See Drawing
			Location:		See Drawing
	SVT3	Resilient Tile Flooring:	Mfr.:		American Biltrite
		Solid Vinyl Tile	Style:		Texas Granite
			Color:		Grey
			Size:		12x12
			Thickness:		2mm
			Adhesive:		Manufacturer's recommended for floor slab conditions. Renovated and new construction may require separate adhesives.
			Installation:		See Drawing
			Location:		See Drawing
	SVT4	Resilient Tile Flooring:	Mfr.:		American Biltrite
		Solid Vinyl Tile	Style:		Texas Granite
			Color:		Sky Blue
			Size:		12x12
			Thickness:		2mm
			Adhesive:		Manufacturer's recommended for floor slab conditions. Renovated and new construction may require separate adhesives.
			Installation:		See Drawing
			Location:		See Drawing
096513	RB1	Resilient Base & Accessories	Mfr.:		Tarkett
		Rubber Wall Base	Style:		Traditional Wall base
			Color:		Grey WG
			Height:		4"
			Note:	1	Provide Cove At Floors With No Finish Or Resilient Finish.
				2	Provide Straight At Carpet.
			Location:		Refer To Finish Schedule
096723	RF1	Resinous Flake Epoxy	Mfr.:		Terrazzo & Marble
			System:		Terroxy Resin Systems Flake Epoxy
			Base:		4" Integral Cove
			Location:		Refer to drawings
			Flake Size:		Terrazzo Look
			Color:		RS-24-011

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
			Top Coat Roughness		Fine
096813	CPT1	CARPET TILE	Mfr.:		Patcraft
		Typical	Collection:		Crafted Surface
			Style:		Overlayer
			Color:		Taupe Tuft 00540
			Size:		18x36
			Fiber:		100 % Eco Soultion Q Link
			Dye Method:		100% Solution Dyed
			Backing:		Synthetic
			Installation:		Ashlar
			Location:		Refer to Drawings
096813.01		CARPET TILE INSTALLER'S CERTIFICATION			INSTALLATION CERTIFICATE
097726	WG1	Printed Display Material	Mfr:		Lynn Monster Color
		Vinyl Wall Graphic	Graphic:		Custom Wall Graphic
			Substrate:		3Mij 180 Cd2 With Overlaminate
			Finish:		Matte
			Size:		Refer To drawings
			Note:		Graphics To Be Provided At A Later Date
099000	P1	Painting	Mfr.:		Sherwin Williams
		Typical Paint	Color:		Incredible White
			Number:		SW7028
			Sheen:	1	Flat At Ceilings
				2	Eggshell At Gypsum Walls
				3	Semi-Gloss At Cmu Walls
			Location:		Refer to finish schedule
	P2	Painting	Mfr.:		Sherwin Williams
		Hollow Metal Frames	Color:		Peppercorn
			Number:		SW7674
			Sheen:	1	Semi Gloss at HM frames
	P3	Painting	Mfr.:		Sherwin Williams
		Ceiling Paint	Color:		Pure White
			Number:		SW7005
			Sheen:	1	Flat At Ceilings
				2	Eggshell At Gypsum Walls
				3	Semi-Gloss At Cmu Walls
	P4	Painting	Mfr.:		Sherwin Williams
		Accent Color	Color:		Argos
			Number:		SW7065
		Dark Grey	Sheen:	1	Flat At Ceilings
				2	Eggshell At Gypsum Walls
				3	Semi-Gloss At Cmu Walls
			Location:		Lab Spaces
	P5	Painting	Mfr.:		Sherwin Williams
		Accent Color	Color:		Hyper Blue
			Number:		SW6965
		Blue	Sheen:	1	Flat At Ceilings
				2	Eggshell At Gypsum Walls
				3	Semi-Gloss At Cmu Walls
	P6	Painting	Mfr.:		Sherwin Williams
		Ceiling Black	Color:		Iron Ore
			Number:		SW7069
		Black	Sheen:	1	Flat At Ceilings & Drywall Grid system
	SC1	Painting	Mfr.:		Sherwin Williams
		Sealed Concrete	Color:		Clear
			Type:		H&C Concrete Wet Look
			Location:		Refer to finish schedule
101101	MB1	Visual Display Boards	Mfr.:		Claridge
		Markerboard	Surface:		Porcelain
			Color:		White
			Size:		6'x4'
			Location:		Refer To Floor Plans

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
	MB2	Visual Display Boards	Mfr.:		Claridge
		Markerboard	Surface:		Porcelain
			Color:		White
			Size:		4'x4'
			Location:		Refer To Floor Plans
	MB3	Visual Display Boards	Mfr.:		Teknion
		Mobile Markerboard/Technology Board	Style:		Routes Tech Board
			Number:		CQCTB
			Surface:		Tech Board, Whiteboard Laminate Fixed Board WZ
			Color:		White
			Size:		77"x64"
			Location:		Refer To Floor Plans
	MB4	Visual Display Boards	Mfr.:		Claridge
		Markerboard	Surface:		Porcelain
			Color:		White
			Size:		3' X 5'
			Location:		AG Lab, East wall
	TB1	Visual Display Boards	Mfr.:		Claridge
		Tackboard	Surface:		Vinyl faced/Cork
			Color:		Tbd
			Size:		4'x4'
			Location:		Refer To Floor Plans
	TB2	Visual Display Boards	Mfr.:		Claridge
		Tackboard	Surface:		Vinyl faced/Cork
			Color:		Tbd
			Size:		8'x4'
			Location:		Refer To Floor Plans
101424		Signs	Mfr:		Fast Signs
		Room Signage	Background Color:		Tbd
			Copy Color:		Tbd
			Size:		8" X 8"
			Location:		Typical
		Signs	Mfr:		Fast Signs
		Fabricated Dimensional Letters	Color:		Tbd
			Material:		Aluminum
			Font:		TBD
			Script:		FRANKLIN - SIMPSON HIGH SCHOOL (1'-0" Height) WEST CAMPUS (1'-2" Height)
			Location:		Typical
		Signs	Mfr:		Fast Signs
		Plaque	COLOR:		TBD MANUFACTURERS STANDARDS
			SIZE:		2'-7" X 1'-8"
			LOCATION:		REFER TO DRAWINGS
101550	TC1	Toilet Compartments	Mfr.:		Scranton Products
		And Urinal Screens	Style:		Solid Plastic / Phenolic
			Color:		TBD MANUFACTURERS STANDARDS
			Mounting Method:		Floor Anchored / Overhead Braced
			Finish:		Hammered
			Location:		Restrooms
102123	CC1	Cubical curtain	Mfr.:		Momentum
		Allied Health	Style:		Mood
			Color:		Twilight
			Location:		Health Science Cubical Curtains
102601	CG1	Wall & Corner Gaurds	Mfr.:		Construction specialties
			Style:		SSM-20N
			Height:		4' Typical
			Thickness:		2"
			Color:		TBD Manufacturers Standards
			Location:		Gypsum Corners, Refer to Drawings
	VR1	VINYL RUBRAIL	Mfr.:		Construction specialties

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
			Product:		Vinyl Rub Strip - 4000 RS-40N
			Height:		32" (Top of rubrail to be at 32" A.F.F)
			Size:		4"
			Thickness:		.060"
			Color:		TBD
	WSP1	Wall Protection Wood Look	Mfr.:		Construction specialties
		Health Sciences Head Walls	Style:		Interior Wall Panels,4000 Series
			Color:		White Papyrus #1609
			Size:		4' X 8'
			Details:		Thin Trim, Aluminum
			Thickness:		3/8"
			Mounting:		Permanent Adhesive
			Location:		Health Sciences Headwalls
	WSP2	Wall Protection Wood Look	Mfr.:		Construction specialties
		Column surround sewing lab	Style:		Interior Wall Panels,4000 Series
			Color:		TBD
			Size:		4' X 8'
			Details:		Thin Trim, Aluminum
			Thickness:		3/8"
			Mounting:		Permanent Adhesive
			Location:		Column surround up to 4' all sides, with all trims to complete install
102800		Toilet & Bath Accessories			
104300	SA1	Emergencey Aid Specialties	Mfr.:		Carolina
		Goggle Cabinet	Product:		Goggle Sanitizer Cabinet
			Model:		646846
			Capacity:		35 Goggles
			Size:		26" W x 29" H
			Mounting Height:		TBD
			Color:		White
			Power Req:		120 V, AC Coordinate with MEP
	SA2	Emergencey Aid Specialties	Mfr.:		First Aid Products Online
		First Aid Cabinet	Product:		Ansi Class A First Aid Kit and PPE
			Model:		640-500PP
			Dimensions:		10"L X 7"H X 3"W
			Location:		Refer To Drawings
	SA3	Emergencey Aid Specialties	Mfr:		Grainger
		Fire Blanket	Product:		Sellstrom Fire Blanket and Cabinet: 60 in blanket WD 72" Blanket LG, Fiber Glass
			Cabinet Size:		15" H X 15" W X 2"D
			Item:		5UPX8
			Model:		S97457
			Location:		Refer To Drawings
105050	ML1	Metal Lockers	Mfr.:		Lyon Lockers
			Color:		Ocean Blue
			Size:		12x15x36 Double
			Location:		Typical
			Note:	1	Masonry Base & Sloping Top
				2	Owner Provided Locks
	HDS1	Heavy Duty Steel Shelving	Mfr.:		Lyon Shelving
			Style:		8000 Series
			Gauge:		18 gauge extra heavy duty
			Size:		Refer to drawings, Various widths, 84" Height
			Location:		AG & Welding Storage
105723	CWS1	Closet Wire Shelving	Mfr.:		Closetmaid
			Style:		Maxload Wire Shelving
			Color:		Satin Chrome
			Size:		Refer to drawings, 16" depth, Stacked 3 units high per wall
			Location:		Health Science & IT Storage
	PB1	Steel Wall Mounted Pegboard	Mfr.:		Global Industrial
			Style:		Powdercoated Steel Pegboard
			Color:		Blue
			Size:		Refer to drawings, 36"x19"
			Location:		Welding and Construction storage

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
106560	WBC1	Welding Booth Curtain	Mfr.:		Akon
			Color:		TBD
			Style:		Vision Panel
			Mount:		Rod and Grommets - Wall to wall mount
			Size:		Refer to drawings
			Location:		Typical
114000	STST1	Food service Equipment	Mfr.:		Advance Tabco
		Stainless Steel Cabinets	Product:		Economy Enclosed Base Tables
			Model Number:		ECK-SS-305M (W/ Backsplash) ECB-SS-305M (W/ Out Backsplash)
			Size:		30" X 60"
			Door type:		Sliding Doors
			Backsplash:		5" Backsplash when cabinet is against wall, no backsplash when cabinet is used as an island.
			Steel Grade:		304
			Gauge:		16
			Location:		Cullinary Class Room: See drawings for more information
	STST2	Food service Equipment	Mfr.:		Advance Tabco
		Stainless Steel Cabinets	Product:		Economy Enclosed Base Tables
			Model Number:		ECK-SS-306M (W/ Backsplash) ECB-SS-306M (W/ Out Backsplash)
			Size:		30" X 72"
			Door type:		Sliding Doors
			Backsplash:		5" Backsplash when cabinet is against wall, no backsplash when cabinet is used as an island.
			Steel Grade:		304
			Gauge:		16
			Location:		Cullinary Class Room: See drawings for more information
	STST3	Food service Equipment	Mfr.:		Advance Tabco
		Stainless Steel Cabinets	Product:		Economy Enclosed Base Tables
			Model Number:		ECK-SS-308M (W/ Backsplash) ECB-SS-308M (W/ Out Backsplash)
			Size:		30" X 96"
			Door type:		Sliding Doors
			Backsplash:		5" Backsplash when cabinet is against wall, no backsplash when cabinet is used as an island.
			Steel Grade:		304
			Gauge:		16
			Location:		Cullinary Class Room: See drawings for more information
	STST4	Food service Equipment	Mfr.:		Advance Tabco
		Stainless Steel Work Table	Product:		Economy WorkTables
			Model Number:		MSLAG-306-x
			Size:		30" X72"
			Door type:		Undershelf
			Steel Grade:		304
			Gauge:		16
			Location:		See drawings for more information
	STST5	Food service Equipment	Mfr.:		Advance Tabco
		Stainless Steel Pot Rack	Product:		Stainless Steel Pot Rack
		Culinary Work tables	Model Number:		SWT-72
			Size:		72"
			Mount:		Rear mount TA-229
			Accessories:		PT-10R-72,PT-15R-72, AUR-72
			Gauge:		18
			Location:		See drawings for more information
	MSS1	Food service Equipment	Mfr.:		Metro Shelving
		Mobile Storage Shelving	Style:		Super Erecta Pro Carts with wheels
		Mobile	Color:		Stainless Steel
			Size:		Refer to drawings, Various widths, 69" Height
			Location:		Culinary Arts & IT storage
122413	RWS1	Manual Window Shades	Mfr.:		Draper
		Roller Window Shades	Shade Fabric:		Sheereweave SW2400
			Openness Factor:		3%
			Color:		TBD
			Fascia:		Clear Anodized
			Location:		All Exterior Windows
	RWS2	Manual Window Shades	Mfr.:		Draper

SPEC SECTION	KEY	FINISH			DESCRIPTION (BASIS OF DESIGN)
		Roller Window Shades	Shade Fabric:		Sunbloc Series SB9000
			Openness Factor:		Opaque
			Color:		TBD
			Fascia:		Clear Anodized
			Location:		Corridor Windows
	BWS1	Blackout Window Shades	Mfr.:		Blackout Ez
			Product:		Classroom Door Lockdown Shade
			Size:		Refer To Door Schedule For Door Lite Sizes
			Location:		Classroom Door Lites
123550	HPL6	High Pressure Laminate	Mfr.:		Wilson Art
		Countertops	Color:		Pewter Mesh
			No:		4878 - 38
			Finish:		Fine Velvet
			Location:		Typ Counter Top
	HPL7	High Pressure Laminate	Mfr.:		Wilson Art
		Base and Wall Cabinets	Color:		Phantom Cocoa
			No:		8213K - 28
			Finish:		Fine Velvet
			Location:		Typ Casework

SECTION 092116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing. non-loadbearing.

B. Metal channel ceiling framing.

C. Sound Attenuation Batts / Acoustic insulation.

D. Cementitious backing board.

E. Gypsum wallboard.

F. Glass mat faced gypsum board.

G. Joint treatment and accessories.

H. Fiberglass reinforced plastic (FRP) wall panels.

I. Suspended gypsum board on track/grid.

J. Products installed, but not furnished, under this Section include the following:
   1. Access panels to be furnished by, but not limited to the following; mechanical, electrical, plumbing, controls, communication/data contractors.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Building framing and sheathing.

B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

C. Section 072100 - Thermal Insulation: Thermal insulation.

D. Section 074213 - Metal Wall Panels: Subgirts/z-furring for metal wall panels.

E. Section 075400 - Thermoplastic Membrane Roofing: Gypsum based roof cover board for field of roof.

F. Section 078400 - Firestopping: Top-of-wall assemblies at fire rated walls.

G. Section 079005 - Joint Sealers: Acoustic sealant/sound caulk.

H. Section 083100 - Access Doors and Panels: Access panels in partitions and ceilings. Access door panels to receive gypsum board

I. Section 102601 - Wall and Corner Guards: Standard corner guards.

1.03 REFERENCE STANDARDS

A. AISI S220 - North American Standard for Cold-Formed Steel Framing - Nonstructural Members; 2015.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015.

C. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

D. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

H. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

I. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

J. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

K. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

L. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

N. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

O. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.

P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

Q. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

R. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

S. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

T. GA-214 - Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels; 2015

U. GA-216 - Application and Finishing of Gypsum Board; 2013.

V. GA-253 - Recommended Specifications for the Application of Gypsum Sheathing; Gypsum Association; 1999.

W. GA-600 - Fire Resistance Design Manual; 2015.

X. GA-801 - Handling of Storage of Gypsum Panel Products; current edition.

Y. ICC (IBC) - International Building Code; 2015.

Z. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

A. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system, FRP panels, and corner guards.

B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.05 QUALITY ASSURANCE

A. Perform in accordance with ASTM C840 and GA-214 and GA-216. Comply with requirements of GA-600 for fire-rated assemblies.

B. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packaging, containers or bundles bearing the manufacturers brand name and identification.

B. Store materials inside and under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes.

C. Stack panels flat to prevent sagging.

D. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim form being bent or damaged.

E. In addition follow the guidelines found in GA-801.

F. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI's "Code of Standard Practice".

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 or GA-216 requirements, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet or moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840, GA-214 and GA-216.
   1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.

B. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include;
   1. Metal Framing, Connectors, and Accessories:
      a. Clark Dietrich Building Systems: www.dietrich.com
      b. J. N. Linrose Manufacturing LLC: www.jnlinrose.com
      c. Marino Ware: www.marinoware.com.
      d. MBA Buiding Supplies: www.mbastuds.com

e. Mill Steel Framing: www.millsteelframing.com
f. Phillips Manufacturing Company: www.phillipsmfg.com.
g. Southeastern Stud and Components, Inc: www.sestud.com
h. Telling Industries, LLC: www.tellingindustries.com.

C. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include;
1. Drywall Suspension Systems and Accessories: Contractor's option to use a drywall suspension system for the gypsum board ceilings in lieu of metal stud ceiling framing.
a. Armstrong Commercial Ceilings: www.armstrong.com
b. USG: www.usg.com
c. Chicago Metallic Corporation: www.chicago-metallic.com

D. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
1. Minimum recycled content of 30%. Preference shall be given for steel framing components containing locally recovered steel.
2. All Framing and System Components: Minimum G40 zinc-coated hot dipped galvanized steel, per ASTM A 653 or coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40 (Z120) coating, roll-formed from steel meeting mechanical and chemical requirements of ASTM A 1003 with a zinc-based coating. Galvannealed products are not acceptable.
a. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
b. Equivalent Gauge Thickness for Steel Studs and Runner: Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86 (current edition) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C645. The submission of an evaluation report is acceptable to show conformance to this requirement.
1) Clark Dietrich Building System - ProStud: www.clarkdietrich.com.
2) Marino\Ware - Viper Stud: www.marinoware.com
3. Studs: "C" shaped with flat or formed webs with knurled faces.
4. Runners: U shaped, sized to match studs.
5. Ceiling Channels: C-shaped.
6. Furring at Walls: Hat-shaped sections, minimum depth of 7/8 inch.

E. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

F. Partition Head to Structure Connections: Contractor option to friction fit slip leg track or track with slotted holes as specified below:
1. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short.
2. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
a. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
b. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.

G. Drywall Grid System: Grid system meeting ASTM C 635 and ASTM C 645 Standard Specification for Rigid Furring Channels for Screw Applications of Gypsum Board.
1. Contractor option to use this system in lieu of framed construction.

2. Intermediate-duty main beam, G40 zinc-coated hot dipped galvanized steel, double-web construction, profile height of 1-11/16" with peaked roof or rectangular top bulb and 1-1/2" knurled flange.
3. Cross-tees, G40 zinc-coated hot dipped galvanized steel, double-web construction, profile height 1-1/2" with peaked roof or rectangular top bulb and 1-1/2" knurled flange.
4. Wall moldings, galvanized steel, hemmed angle, nominal 1-1/4" x 1-1/4".
5. Hanger wire, minimum 12 gauge and spaced along main beam not more than 4' on center to support load.
6. Add vertical bracing as required to stabilize the frame.
7. Product to have manufacturers 10-year limited warranty.

2.03 BOARD MATERIALS

A. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include;

B. Manufacturers - Gypsum-Based Board:
1. American Gypsum Company: www.americangypsum.com.
2. Saint-Gobain BPB/Certainteed Inc/Continental Building Products: www.certainteed.com.
3. Georgia-Pacific Gypsum(acquired Temple Inland): www.gpgypsum.com.
4. National Gypsum Company: www.nationalgypsum.com.
5. PABCO Gypsum: www.pabcogypsum.com/#sle.
6. USG Corporation/Knauf Group: www.usg.com.

C. Cement Board/Backing Board For Wet Areas:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
   a. Thickness: 5/8 inch.
   b. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include;
      1) Saint-Gobain BPB/Certainteed Inc/Continental Building Products: GlasRoc Tile Backer: www.certainteed.com.
      2) Custom Building Products; WonderBoard Lite Backerboard: www.custombuildingproducts.com.
      3) National Gypsum Company; eXP F5 Tile Backer: www.nationalgypsum.com.
      4) Georgia Pacific: Denshield Tile Backer: www.buildgp.com
      5) USG Corporation; Durock Tile Glass-Mat Backer Board: www.usg.com.
   c. Contractor option to provide/install the following:
      1) Water-resistant gypsum core and glass reinforced facers meeting ASTM C1178
      2) Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
         (a) Certainteed Saint-Gobain: Diamondback GlasRoc Tile Backer: www.certainteed.com

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Interior ceilings, soffits and bulkheads, unless otherwise indicated.
2. Thickness: 1/2 inch.
3. Edges: Tapered.
4. Products:
   a. American Gypsum Company: Interior Ceiling Board: www.americangypsum.com.

b. Saint Gobain/Continental/CertainTeed Corporation; CertainTeed Interior Ceiling Board: www.certainteed.com
c. CertainTeed Corporation; 1/2" Easi-Lite: www.certainteed.com/#sle.
d. Georgia-Pacific Gypsum; ToughRock Span 24 Ceiling Board.
e. National Gypsum Company; Gold Bond High Strength Brand Ceiling Board.
f. Temple-Inland Building Products by Georgia-Pacific, LLC; ToughRock Span24 Ceiling Board.
g. USG Corporation; Sheetrock Ultralight: www.usg.com.

E. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
1. Regular Type:
a. Application: Use for vertical surfaces, unless otherwise indicated.
b. Thickness: 5/8 inch.
c. Edges: Tapered.
d. Application: Where required for fire-rated assemblies, unless otherwise indicated.
2. Fire Resistant Type: Complying with Type X requirements; UL or WH rated.
a. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
b. Application: Where required for fire-rated assemblies, unless otherwise indicated.
c. Thickness: 5/8 inch.
d. Edges: Tapered.

F. Mold-Moisture/Water-Resistant/Abuse Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
2. Edges: Tapered.
a. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include, but are not limited to the following:
1) American Gypsum Company: M-Bloc: www.americangypsum.com.
2) Saint Gobain/Certainteed/Continental Building Products - M2 Tech Type X/C.
3) USG - FiberRock Aqua-Tough or Mold Tough Abuse Resistant: www.usg.com
4) National Gypsum - Gold Bond XP Fire-Shield: www.nationalgypsum.com
5) GP/Temple-Inland - TR Firegaurd X MGD: www.templeinland.com

G. Exterior Roof Board: Sizes to minimize joints in place; ends square cut.
1. Application: Roof board at parapet walls, unless otherwise indicated.
a. Installer/supplier of roof board to coordinate with roofing manufacturer/installer to ensure that roof board selected (fiber-glass faced and/or unfaced/gypsum-fiber board or plywood sheathing per section 061000) meets the roof manufacturers warranty requirements as described in section 075400 Thermoplastic Membrane Roofing.
2. Glass-Mat-Faced Board: Glass mat faced gypsum substrate as defined in ASTM C 1177/C 1177M.
3. Unfaced/Gypsum-Fiber Board: Gypsum-fiber substrate as defined in ASTM C 1278.
4. Core Type: Regular.
5. Board Thickness: 5/8 inch.
6. Edges: Square, for vertical application.
7. Glass-Mat-Faced Roof Board Products:
a. Georgia-Pacific Gypsum LLC; DensDeck Prime.
b. National Gypsum Company: DEXcell FA Glass Mat Roof Board.
8. Unfaced/Gypsum-Fiber Roof Board Products:
a. United States Gypsum Co.; Securock Gypsum Fiber Roof Board.

2.04 FIBERGLASS REINFORCED BOARD MATERIALS

A. FRP (Fiberglass Reinforced Plastic) Wall Panels:
1. FRP panel type: Sanitary.
2. Fire rating: Class 1/C fire rating per ASTM E-84.
3. Surface texture: Smooth.
4. Wall Panel, Trim and Accessories Color: Selected by Architect from manufacturers standard color chart.
5. Trim and Accessories: Extruded rigid PVC trim units and accessories as required for a complete installation including but not limited to inside and outside corners, edge trim, butt joint connectors and base molding.
6. Adhesive: Provide manufacturer's recommended construction adhesives.
7. Sealant: Provide manufacturer's recommended sealant to completely seal all seams and trim intersections.
8. Panel Size at Mop Sinks: 48 inch high, extend 18 inch beyond width of mop sink, each side.
9. Panel Thickness: 3/32" (0.09") nominal.
10. Panel Physical Properties:
    a. Flexural Strengths: 10,000 psi
    b. Flexural Modulus: 3,100,000 psi
    c. Tensile Strengths: 7000 psi
    d. Barcol Hardness: 35
    e. Izod Impact Strength: 7.0-7.2 ft#/in
    f. Thermal Coefficient of Lineal expansion: 15,700,000 in/in/F degrees
    g. Water Absorption: .72%
    h. Specific Gravity: 1.50 - 1.80
    i. Flame Spread: <25
    j. Smoke Generation: <450
11. Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include:
    a. Marlite - Marlite Standard FR Class 1/C: www.marlite.com
    b. Crane Composites - Glasbord Class C: www.cranecomposites.com
    c. NUDO - FiberLite Class C: www.nudo.com
    d. Stabilit America; Glasteel - Glasliner FRP Class 1/C: www.glasteel.com

2.05 ACCESSORIES

A. Sound Attenuation Batts/Blankets/Acoustic Insulation: ASTM C 665; 2.5 pcf nominal density, preformed mineral-fiber, friction fit type, unfaced. Fiber glass sound control batt insulation, unfaced, and must meet the performance requirements of ASTM C 665 "Standard Specification for Mineral Fiber Blanket, Thermal Insulation.
1. Sound Attenuation Batts/Blankets/Acoustic Insulation: ASTM C 665; 2.5 pcf nominal density, preformed mineral-fiber, creased, friction fit type, unfaced. Creased batt width to be one inch wider than the on-center spacing of the studs. Refer to drawings for stud spacing.
    a. Contractor option to provide creased batts/blankets or support batts/blankets with "tiger teeth, lightning rods, or wire stays" between studs or support batts with metal banding attached to the metal studs or metal wire threaded through the stud openings in a continuous manner.
        1) Acceptable Metal Banding Product:
            (a) Insul-Hold Co., Inc. - Insul-Hold: www.insulhold.com
            (1) Class D, ASTM 527-80, 24 gauge galvanized metal strapping with two-three inch long arrows to secure insulation.
2. Contractor option to use one of the following products:

a. Mineral-Fiber Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include:
   1) Owens Corning - Thermafiber SAFB: www.thermafiber.com
   2) Roxul Inc. - Roxul AFB: www.roxul.com
b. Fiber Glass Manufacturers: Subject to compliance with requirements manufacturers offering the following products that may be incorporated into the work include:
   1) JM -Sound Control Batts: www.jm.com
   2) Owens Corning Ecotouch Pink FIberglass Sound Attenuation Batts: www.owenscorning.com

B. Sound Attenuation Batts/Blanket Product Requirements:
1. Sound Attenuation Batts/Blankets/Acoustic Insulation Thickness: Minimum thickness 3 inch at 3-5/8" metal stud walls.
2. Sound Attenuation Batts/Blankets/Acoustic Insulation Thickness: Minimum thickness 6 inch at 6 inch metal stud walls.
3. Sound Attenuation Batts/Blankets/ Acoustic Insulation Width: Minimum width to be the same as the on-center stud spacing indicated on the drawings.

C. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rigid plastic, unless noted otherwise.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
   a. Corner Beads: Low profile, for 90 degree outside corners.
3. Products:
   a. Same manufacturer as board and/or framing materials.
   b. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
   c. Stockton Products: www.stocktonproducts.com/#sle.
   d. Trim-Tex, Inc: www.trim-tex.com/#sle.

D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners.
2. Paper Tape: 2 inch wide, creased paper tape for joints and corners.
3. Ready-mixed and/or field-mixed vinyl-based joint compound.
4. Products:
   a. Same manufacturer as board materials.
   b. CertainTeed Corporation: www.certainteed.com.
   c. USG Corporation: www.usg.com.
   d. Sherwin Williams: www.sherwin-williams.com.
   e. ProForm Finishing Products (National Gypsum Company): www.proformfinishing.com

E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

G. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

H. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.

I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

J. Compressible Filler: In lieu of coping gypsum board to deck profile and providing sound attenuation blanket material and acoustical sealant it is the contractor's option to provide and install cut to fit or premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, EPDM, or PVC.
   1. Install at tops of non-rated, non-load-bearing metal stud walls running perpendicular or parallel to the metal deck . Place a bead of caulk 1/2 inch back from flute opening and on all sides of flute. Compress plug and slide into place.
      a. Perpendicular to metal deck: Williams Products Inc. EVA 200G or 3000 Series Closure Flute Plugs or Strips: www.williamsproducts.net.
         1) Closed Cell plugs and strips per ASTM D-1171, ASTM D-925, ASTM D-412. Density: 12.8 lbs/ft

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling and soffit system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs as indicated on the drawings.
   1. Align and secure top and bottom runners at 24 inches on center.
   2. Install studs vertically.
   3. Align stud web openings horizontally.
   4. Stud splicing is not permissible.
   5. Extend partition framing to underside of floor or roof deck.Attach extended leg top runner to deck, maintain clearance between top of studs and runner, and brace both flanges of studs with continuous bridging.
   6. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track. Contractor option to use slotted track.

D. Corners: Fabricate corners using a minimum of three studs.

E. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

F. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

G. Brace stud framing system rigid.

H. Access Panel Opening Framing: Coordinate with the following, but not limited to; mechanical, electrical, plumbing, communication/data contractors for access panel locations in walls and ceilings.
   1. If access panels are being furnished by other trades verify type of access panel being provided, and if gypsum board on the recess door panel is required.

I. Standard Wall Furring: Install at masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

J. Blocking: See Section 061000 for wood blocking. Install wood blocking for support of:
   1. Cabinets, shelf, and countertop supports.
   2. Wall mounted cabinets.

3. Wall brackets.
4. Handrails and guardrails.
5. Fire extinguisher cabinets, brackets, and valve cabinets.
6. Grab bars.
7. Toilet and bath accessories.
8. Toilet and urinal partitions.
9. Wall-mounted door hardware and stops.
10. Chalkboards, tackboards, and marker boards.
11. Wall paneling and trim.
12. Joints of rigid wall coverings that occur between studs.
13. Locker base and wall attachment.
14. Interior and exterior wall openings to receive metal frame system; window, door, etc.
15. Access panels.
16. Framed openings.
17. Plumbing fixtures.
18. Ceiling mounted projection screens and projector mounts.
19. Wall mounted projection screens and projector mounts.
20. Wall and ceiling mounted items indicated as N.I.C. and/or Owner provided and Owner installed.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Sound Attenuation Batts /Acoustic Insulation: Friction fit, by placing tightly within on-center stud spacing, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant/Sound Caulk: Install per requirements of 079005 - Joint Sealers

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

C. Glass Mat Faced Gypsum Board: Install in strict accordance with manufacturer's instructions.

D. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
2. At exterior soffits, not more than 30 feet apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 LEVELS OF GYPSUM BOARD FINISH

A. Paper Faced Gypsum Board: Use paper or fiberglass joint tape, bedded with powder-type or ready-mixed vinyl-based joint compound and finished with powder-type or ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in GA-214 and ASTM C 840, as follows:
1. Level 4: Walls, ceilings and soffits to receive flat, eggshell, semi-gloss or gloss paint.
2. Level 2: Behind cabinetry, FRP panels in janitorial/custodial rooms and on backing board to receive tile finish.

3. Level 1: Fire rated wall and non-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 092116

SECTION 093000
TILING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
   1. Porcelain floor and wall tile (CT1- CT6)
   2. Setting and grouting materials
   3. Self-leveling system comprised of clips & wedges

1.02 RELATED REQUIREMENTS

A. Section 01 - Alternates: Refer to section for additional information.

B. Section 01 - Administrative Requirements - Submittal procedures

C. Section 079005 - Joint Sealers: Acoustic sealant/sound caulk

D. Section 090050 - Finish Legend

E. Section 092116 - Gypsum Board Assemblies: Tile backer board

F. Section 224000 - Plumbing Fixtures: Shower receptor

1.03 REFERENCE STANDARDS

A. ANSI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

B. ANSI A118.7 American National Standard Specifications for High Performance Cement Grouts for Tile Installation (2019)

C. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).

D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).

E. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation; 2014.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

H. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

J. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

K. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride;2011.

L. ICC (IBC) - International Building Code; 2012, with Kentucky Amendments; current edition.

M. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023

N. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data: Provide manufacturer's data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop drawings indicating tile patterns and locations and widths of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
   1. Locate precisely each joint and crack in tile substrates by measuring, record measurements on shop drawings, and coordinate them with tile joint locations, in consultation with Architect.

D. Samples for initial selection purposes in form of manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures, and patterns available for each type and composition of tile indicated. Include samples of grout and accessories involving color selection.

E. Samples for verification purposes of each item listed below, prepared on samples of size and construction indicated, products involve color and texture variations, in sets showing full range of variations expected.
   1. Each type and composition of tile and for each color and texture required, at least 12 inches square, mounted on plywood or hardboard backing and grouted.
   2. Full-size units of each type of trim and accessory for each color required.

F. Master grade certificates for each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

G. Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of tile and tile setting and grouting products with requirements indicated.

H. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, plus other information specified.

I. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 016000 - Product Requirements, for additional information.

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

C. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings".

E. Maintain one copy of ANSI A108/A118/A136.1 and TCNA (HB) on site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If despite these precautions coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.07 PROJECT CONDITIONS

A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at 50 deg F (10 deg C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.09 WARRANTY

A. See Section 01 - Closeout Submittals for additioanl warranty requirements

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

1.10 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials that match products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
   1. Tile and Trim Units: Furnish quantity of full-size units equal to _3_ percent of amount installed, for each type, composition, color, pattern, and size.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include the following:
   1. Porcelain Tile:
      a. Atlas Concorde
      b. Portobello Tile
      c. American Olean Tile Co., Inc.
      d. Crossville, Inc.
      e. Dal-Tile Corp.
      f. Mid-State Tile Co.
      g. Monarch Tile Manufacturing, Inc.
      h. Summitville Tiles, Inc.
      i. United States Ceramic Tile Co.
      j. Villeroy & Boch (USA) Inc.
      k. Wenczel Tile Co.

l. Winburn Tile Manufacturing Co.

2. Latex-Emulsion Based-Portland Cement Mortars:
   a. Boiardi Products Corp.
   b. Bostik Construction Products Div.
   c. C-Cure Chemical Co.
   d. Custom Building Products
   e. Dal-Tile Corp.
   f. DAP, Inc. Div.; USG Corp.
   g. H.B. Fuller
   h. Laticrete International, Inc.
   i. L&M Mfg., Inc.
   j. TEC
3. High Performance Grout:
   a. TEC Power Grout 550
   b. Custom Prisma
   c. Grout shall be supplied from the same manufacturer as the mortar

2.02 PRODUCTS, GENERAL

A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
   1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.

B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
   1. Provide porcelain paver selections by interior designer.
   2. Provide tile trim and accessories that match color and finish of adjoining flat tile unless otherwise indicated.

D. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

2.03 TILE PRODUCTS

A. Porcelain Floor Tile & Base (CT1): Provide tile complying with the following requirements:
   1. Composition: Porcelain.
   2. Nominal Thickness: 3/8 inch.
   3. Face: Plain with square edges.
   4. Basis of Design:
      a. Manufacturer: Portobello America
      b. Style: Fusion
      c. Color: Carbon Nat Bold
      d. Size: 12x24
      e. Installation: stackbond

B. Porcelain Wall Tile & Base (CT2): Provide tile complying with the following requirements:
   1. Composition: Porcelain.
   2. Nominal Thickness: 3/8 inch.
   3. Face: Plain with square edges.
   4. Basis of Design:
      a. Manufacturer: Portobello America
      b. Style: Fusion
      c. Color: Chalk Nat Bold

d. Size: 12x24
e. Installation: stackbond

C. Porcelain Wall Tile & Base (CT3): Provide tile complying with the following requirements:
1. Composition: Porcelain.
2. Nominal Thickness: 3/8 inch.
3. Face: Plain with square edges.
4. Basis of Design:
a. Manufacturer: American Olean
b. Style: Color Story
c. Color: 0070 Sapphire Sky
d. Size: 4x16
e. Installation: Custom: refer to drawings

D. Porcelain Wall Tile & Base (CT4): Provide tile complying with the following requirements:
1. Composition: Porcelain.
2. Nominal Thickness: 3/8 inch.
3. Face: Plain with square edges.
4. Basis of Design:
a. Manufacturer: American Olean
b. Style: Color Story
c. Color: 0006 Shadow
d. Size: 4x16
e. Installation:Custom: refer to drawings

E. Porcelain Wall Tile & Base (CT5): Provide tile complying with the following requirements:
1. Composition: Porcelain.
2. Nominal Thickness: 3/8 inch.
3. Face: Plain with square edges.
4. Basis of Design:
a. Manufacturer: American Olean
b. Style: Color Story
c. Color: 0025 Ice White
d. Size: 4x16
e. Installation:Custom: refer to drawings

F. Porcelain Wall Tile & Base (CT6): Provide tile complying with the following requirements:
1. Composition: Porcelain.
2. Nominal Thickness: 3/8 inch.
3. Face: Plain with square edges.
4. Basis of Design:
a. Manufacturer: American Olean
b. Style: Color Story
c. Color: 0014 Balance
d. Size: 4x16
e. Installation:Custom: refer to drawings

G. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:
1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
2. Shapes: As follows, selected from manufacturer's standard shapes:
a. Base for Thinset Mortar Installations: Coved.
b. External Corners for Thinset Installations: Surface bullnose.
c. Internal Corners: Field-butted square corners, except use coved base and cap angle pieces designed to member with stretcher shapes.

2.04 SETTING & GROUTING MATERIALS

A. Portland Cement Mortar Installation Materials: Provide materials to comply with ANSI A108.1 as required for installation method designated, unless otherwise indicated.

B. Latex-Portland Cement Mortar: Provide product complying with ANSI A108.1 and the following requirement for composition:
   1. Prepackaged dry mortar mix incorporating dry polymer additive in the form of a re-emulsifiable powder to which only water is added at the job site.

C. Grouting Materials:
   1. Dry Set Grout: Provide product complying with ANSI A118.7 of color indicated.
   2. Prepackaged Dry Grout Mix incorporating dry polymer additive in the form of a re-emulsifiable powder to which only water is added at job site.
   3. Note: Grout joint widths shall be minimum required per manufacturer's recommendations. The grout shall fill the joint space and be no lower than 1/32" of an inch from the top face of the tile.

2.05 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with requirements of Division 7 Section "Joint Sealers," including ASTM C 920 as referenced by Type, Grade, Class, and Uses.

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

C. Coordinate Pourable Urethane Sealant at concrete slab for Use T: Type M; Grade P; Class 25; Uses T, M, A, and as applicable to joint substrates indicated, O.

D. Products: Subject to compliance with requirements, manufacturers offering products which may be incorporated into the Work include, but are not limited to, the following:
   1. Sealant Manufacturers
      a. Sealant manufactured by Grout supplier
      b. Color-Rite

2.06 MISCELLANEOUS MATERIALS

A. Metal Transition Strips:
   1. Provide a metal stepless transition strip to match Schluter-Reno U Anodized Aluminum or TK Series (or approved equivalent) at all exposed edges of tile installation.
   2. Provide Schluter Anodized Aluminum AE Cove base profile -DILEX-AHK at intersection of floor and wall tile.
   3. Provide Schulter Jolly at tile termination on continuous wall surfaces.

B. Self-Leveling System: Provide two-part leveling clips and wedges at minimum joint width required by manufacturer as manufactured by one of the following:
   1. Raimondi - Leveling Solutions
   2. Tuscan - Leveling System
   3. QEP - Lash System

2.07 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.
   2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

B. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of temporary protective coating indicated below, taking care not to coat unexposed tile surfaces:
   1. Petroleum paraffin wax or grout release.

C. Protect surrounding work from damage.

D. Vacuum clean surfaces and damp clean.

E. Seal substrate surface cracks with filler. Verify existing substrate surfaces are at acceptable flatness tolerances to receive tile.

F. Coordinate installation of backer board in accordance with ANSI A108.11 and board manufacturer's instructions with gypsum drywall installer.

G. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.

B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated.

C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

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

E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in

each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.

F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealers."

G. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding per TCNA.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113 or F116 (epoxy).

1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122.
2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F131.

B. Over wood substrates, install in accordance with TCNA (HB) Method F150.

C. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - WALL TILE

A. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.06 CLEANING AND PROTECTION

A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or deterioration at time of Substantial Completion.

D. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

E. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.

F. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 095113
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
   1. Acoustical panels Type APC-1 (24" x 24")
   2. Acoustical panel Type APC-2 (24" x 24")
   3. Exposed suspension system (15/16")
   4. Acoustical panel clouds (APC3)
   5. Drywal Grid system for acoustical panels

B. All acoustical panel ceiling components and installation methods shall comply with seismic zone requirements of the Kentucky Building Code.

C. Refer to the reflected ceiling plans A/7.0 for location of existing panels and suspension system to remain.

D. Refer to the Room Finish Schedule on Sheet A 2.0 and the Ceiling Legend and Reflected Ceiling Plan on Sheet A7.0 for the locations of acoustical ceiling tile and grid types.

1.02 RELATED REQUIREMENTS

A. Section 012300 - Alternates: Refer to section for additional information.

B. Section 033000 - Cast-In-Place Concrete: Placement of special anchors or inserts for suspension system

C. Section 053100 - Steel Decking: Placement of special anchors or inserts for suspension system

D. Section 090050 - Finish Legend

E. Section 211300 - Fire Suppression Sprinkler System: Sprinkler heads in ceiling system

F. Section 233700 - Air Outlets and Inlets: Air diffusion devices in ceiling

G. Section 265100 - Interior Lighting: Light fixtures in ceiling system

H. Section 275116 - Public Address Systems: Speakers in ceiling system

I. Section 284600 - Fire Detection and Alarm: Fire alarm components in ceiling system

1.03 DEFINITIONS

A. CAC: Ceiling Attenuation Class.

B. LR: Light Reflectance coefficient.

C. NRC: Noise Reduction Coefficient.

1.04 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.

E. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2005 (Reapproved 2012).

F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

G. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

H. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

I. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

J. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

K. UL (GGG) - GREENGUARD Gold Certified Products; current listings at http://http://productguide.ulenvironment.com/QuickSearch.aspx.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

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

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

D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Acoustical Panel: One set of 6-inch- (150-mm-) square Samples of each type, color, pattern, and texture.
   2. Exposed Suspension System Members, Moldings, and Trim: One set of 12-inch- (300-mm-) long Samples of each type, finish, and color.

E. Qualification Data: For testing agency.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.

G. Research/Evaluation Reports: For each acoustical panel ceiling and components and anchor type.

H. Maintenance Data: For finishes to include in maintenance manuals.

I. NRC: Noise Reduction Coefficient.

1.06 QUALITY ASSURANCE

A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.

B. Source Limitations
   1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
   2. Suspension System: Obtain each type through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
   1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
b. Identify materials with appropriate markings of applicable testing and inspecting agency.

2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended

1.09 SEQUENCING AND SCHEDULING

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.10 WARRANTY

A. See Section 01 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

1.11 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Panels: Full-size panels equivalent to 2.0 percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equivalent to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.01 WARRANTIES

A. Panels shall not sag for 15 years. No limit to relative humidity, short of standing water and up to 120 degrees Fahrenheit.

2.02 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Products: Subject to compliance with requirements, provide one of the products specified.

2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.03 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
   1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.

B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
   1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.04 MINERAL-BASE ACOUSTICAL PANELS - Square Edge

A. Ceiling Type APC-1: (24" x 24" x 3/4")
   1. Products:
      a. Armstrong’s School Zone Fine Fissured No. 1713
      b. USG: “Clima Plus” High NRC No. 22421
      c. CertainTeed “Fine Fissured”
   2. Classification: Provide Class A panels complying with ASTM E 1264 for type, form, and pattern as follows:
      a. Type and Form: Type III, Form 2
      b. Pattern: CE (lightly textured)
   3. Color: White
   4. LR: Not less than 0.84
   5. NRC: Not less than 0.70, U.L. classified label on each carton
   6. CAC: Not less than 35, U.L. classified label on each carton
   7. Edge Detail: Square
   8. Antimicrobial Treatment: Coating based to inhibit mold and mildew
   9. Panels shall exceed ASTM C367 ball hardness test to 210 lbs.

2.05 WASHABLE FACE PANEL CEILING

A. Ceiling Type APC-2: (24" x 24" x 5/8")
   1. Products:
      a. Armstrong's Kitchen Zone No. 673
      b. Sheetrock Gypsum Ceiling Panel No. 3260
      c. National Gypsum Gridstone No. GR5040
   2. Classification: Provide Class A panels complying with ASTM E 1264 for type, form, and pattern as follows:
      a. Type and Form: Type IX, Form 2
      b. Pattern: G
   3. Color: White
   4. LR: Not less than 0.89
   5. NRC: N/A
   6. CAC: Not less than 33, U.L. classified label on each carton
   7. Edge Detail: Square
   8. Antimicrobial Treatment: Coating based to inhibit mold and mildew
   9. Panels shall exceed ASTM C 367 ball hardness test to 210 lbs.

2.06 ACOUSTICAL CLOUD PANELS

A. Ceiling Type: APC3
   1. Basis of Design Product: Feltworks 8246
   2. Colors: Up to three, manufacturer standard selections
   3. Thickness: 1"
   4. NRC: 0.90
   5. Grid: Suspended drywall grid system
   6. Mounting: D40 Magnet and installation accessories to Drywall grid system
   7. Size: Refer to the reflected ceiling plan for cloud sizes and configurations.

2.07 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
   1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
   1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
   2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.
   3. Wire hangers shall be installed on two diagonal corners of each 2' x 4' ceiling grid opening, or equivalent. Refer to the electrical specifications for information concerning the suspension system for ceiling mounted equipment.

2.08 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILINGS

A. Available Products:
   1. Armstrong Prelude XL
   2. USG DX/DXL 24 Series
   3. Chicago Metallic CMC 1200 Series
   4. Gordon, Inc.

B. Wide-Face, Capped, Double-Web, Fire-Rated Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished **15/16-inch- (24-mm-)** wide metal caps on flanges.
   1. Structural Classification: Intermediate-duty system
   2. End Condition of Cross Runners: Override (stepped) or butt-edge type
   3. Face Design: Flat, flush
   4. Cap Material: Cold-rolled sheet
   5. Cap Finish: Painted white
   6. Width: 15/16"
   7. Corner trim: Pre-Manufactured

C. Drywall Grid System: Grid system meeting ASTM C 635 and ASTM C 645 Standard Specification for Rigid Furring Channels for Screw Applications of Gypsum Board.
   1. Basis of Design: Armstrong Frameall Drywall Grid

2. Contractor option to use this system in lieu of framed construction.
3. Intermediate-duty main beam, G40 zinc-coated hot dipped galvanized steel, double-web construction, profile height of 1-11/16" with peaked roof or rectangular top bulb and 1-1/2" knurled flange.
4. Cross-tees, G40 zinc-coated hot dipped galvanized steel, double-web construction, profile height 1-1/2" with peaked roof or rectangular top bulb and 1-1/2" knurled flange.
5. Wall moldings, galvanized steel, hemmed angle, nominal 1-1/4" x 1-1/4".
6. Hanger wire, minimum 12 gauge and spaced along main beam not more than 4' on center to support load.
7. Add vertical bracing as required to stabilize the frame.
8. D-40 Magnet attachment of panels to grid system
9. Drywall grid system to be painted black to match painted exposed ceiling.
10. Product to have manufacturers 10-year limited warranty.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

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

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.03 INSTALLATION, GENERAL

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
   1. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit. Where the unfinished/unpainted cut edge of a tile is exposed the edge shall be repainted to achieve a "finished" appearance.
   1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
   2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
   3. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Fit border trim neatly against abutting surfaces.

B. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

3.05 FIELD QUALITY CONTROL

A. Remove and replace acoustical panel ceiling hangers where test results indicate that they do not comply with specified requirements.

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

3.06 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touch up of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 096500
RESILIENT TILE FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
   1. Solid Vinyl tile pattern diagram. The flooring Contractor will be responsible for submitting a complete measured floor pattern diagram for all areas to receive a floor tile pattern. The diagram will locate all floor tile pattern locations for approval prior to beginning work.
   2. Solid vinyl tile (SVT1 - SVT4).
   3. Provide resilient flooring transitions between all dissimilar resileint materials of varied heights.

B. Floor Slab Preparation: The installer is required to prepare all areas of floor slabs by utilizing a self leveling material equivalent to Mapei M-20 with T-2 primer, Schonox XM or TEC Level Set 300, as required over the entire floor surface. Following the manufacturer's directions completely before installing tiles.

C. Floor Slab Preparation in new building construciton: Provide floor slab preparation as needed per products stated above.

D. Sections 096500 thru 096513 and 096813 thru 096816 shall not be combined with any other bid packages. The installer must be CFI certified (C-2 level or higher). A certified person should be on the job at all times during the installation procedures.

1.02 RELATED REQUIREMENTS

A. Section 090050 - Finish Legend.

B. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base, reducer strips and other accessories installed with resilient floor tile.

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

I. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. Product data for each type of product specified.

B. Samples for Initial Selection: For each type of resilient floor tile indicated.

C. Samples for Verification: Full-size units of each color and pattern of resilient floor tile required.

D. Maintenance Data: For resilient products to include in maintenance manuals.

1.05 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store tiles on flat surfaces.

1.07 PROJECT CONDITIONS

A. Substrate Conditions: Use the method described below to determine the dryness as required to ensure initial and long-term success.
   1. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs using In Situ Probes.
      a. Three tests should be conducted for areas up to 1,000 square feet and one additional test should be conducted for each additional 1,000 square feet of flooring.
      b. Results must not exceed 75% when tested to ASTM F 2170. A diagram of the area showing the location and results of each test shall be submitted to the Interior Designer/Architect. If the test results exceed the limitations, the installer must not proceed until the problem has been corrected.

B. The flooring contractor shall verify in writing to the owner, a minimum of thirty (30) days prior to scheduled resilient flooring installation, the following substrate conditions:
   1. Moisture: Initial emission rate, as tested with a calcium chloride test kit, per ASTM F 1869-89 requirements.
   2. Alkalinity: Maximum pH of 9.

C. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

D. After post-installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

E. Close spaces to traffic during floor covering installation.

F. Close spaces to traffic for 48 hours after floor covering installation.

G. Install resilient products after other finishing operations, including painting, have been completed.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.09 WARRANTY

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

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color and pattern of floor tile installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following including:
   1. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. SVT - American Biltrite
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Patcraft Admix - SVT
      b. Shaw - Montage
      c. Flexco
      d. Nora/Interface
      e. Additional Manufacturers: Other manufacturers proposed which meet the specific standards specified shall submit actual samples and specifications for review to the Designer/Architect not less than seven (7) days before the bid date.

2.02 COLORS AND PATTERNS

A. Colors and Patterns: As selected by Interior Designer from manufacturer’s full range.

2.03 SOLID VINYL TILE

A. Basis of Design: American Biltrite
   1. Style: Texas Granite
   2. Colors: Manufacturer's Standards, Colors Up to four colors
   3. Size: 12" x 12"
   4. Thickess: 2mm
   5. Adhesive: Manufacturer's recommended for floor slab conditions. Renovated and new construction may require separate adhesives.
   6. Finish: Burmished to high gloss.
   7. Fire-Test-Response Characteristics:
      a. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648

2.04 INSTALLATION MATERIALS

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

B. Adhesives: Taylor Dynamic, 99% RH adhesive: Water-resistant type approved by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content and other conditions affecting performance.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale and foreign deposits that might interfere with adhesion of resilient products.
   2. The flooring Contractor shall prepare floor slabs to receive new floor covering to prevent telegraphing of irregular slab conditions per the floor covering manufacturer's recommendations.
   3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM E 710.
   1. Where irregular slab conditions occur, utilize self leveling material as required (or approved equivalent) to return the slab to a smooth, level surface.
   2. Verify that substrates are dry and free of curing compounds, sealers and hardeners.
   3. Moisture Testing:
      a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb. of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
      b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

D. Use trowelable leveling and patching compound to fill cracks, holes and depressions in substrates. Prepare all slabs to receive new floor covering to prevent telegraphing of irregular slab conditions per the floor covering manufacturer's recommendations.

E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
   1. Do not install resilient products until they are same temperature as space where they are to be installed.

F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

G. Where any concrete slab expansion material has been utilized adjacent to walls, columns, etc. and the thickness exceeds 1/4" out from the vertical surface. The flooring installer shall remove the expansion material and clean out the void in the floor surface. The installer shall then place a 1/4" thick removable spacer along the vertical surface and fill the remaining void with a self-leveling material (or approved equivalent). After the leveling material has cured, remove the 1/4" spacer and install tile per manufacturer's recommendations.

3.03 TILE INSTALLATION

A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter.

B. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
   1. Lay tiles square with room axis unless otherwise indicated.

C. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, including pipes, outlets, edgings, door frames, thresholds and nosings. Ties shall be installed under cabinets and casework.

D. Extend tiles into toe spaces, door reveals, closets, and similar openings.

E. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.

F. Install tiles on covers for telephone and electrical ducts, and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly adhere tile edges to substrates that abut covers and to cover perimeters..

G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, and puckering at joints. Telegraphing of adhesive spreader marks and other surface imperfections.

H. Maintain tile coursing, ensure that all tile coursing runs true and even, at no time shall coursing be allowed to “grow” or “shrink” causing uneven joints. Notify Designer/Architect of problems with the tile sizes.

I. Where floor tile borders/patterns occur, the center "field" tiles shall be full size tiles and the border tiles along the wall shall be cut to center the field tiles.

3.04 SEQUENCING AND SCHEDULING

A. Install tiles and accessories per the work schedule set by the Construction Manager.

B. Do not install tiles over concrete slabs or areas of patching until all areas are sufficiently dry to bond with adhesive as determined by tile manufacturer’s recommended bond and moisture test.

3.05 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.
      a. Do not wash surfaces until after time period recommended by manufacturer.

B. Protect resilient flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by tile manufacturer.
   1. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
   2. Do not move heavy and sharp objects directly over surfaces. Place hard board or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

SECTION 096513
RESILIENT WALL BASE AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
   1. Resilient wall base (RB1) - rolls only. Refer to the drawings and the room finish schedule for additional information.
   2. Resilient flooring accessories

B. Sections 096500 thru 096513 and 096813 thru 096816 shall not be combined with any other bid packages. A certified person should be on the job at all times during the installation procedures.

1.02 RELATED REQUIREMENTS

A. Section 090050 - Finish Legend

B. Section 096502 - Resilient tile flooring

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement (replaced SG-971)

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009

I. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition

1.04 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
   1. Product data for each type of product specified
   2. Samples for initial selection purposes of manufacturer's standard sample sets in form of pieces cut from each type of product specified showing full range of colors and patterns available

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility for Products: Obtain each type and color of product specified from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Fire Performance Characteristics: Provide products with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

C. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.

D. Smoke Density: Less than 450 per ASTM E 662.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Project site in original manufacturer's unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

B. Store products in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).

C. Move products into spaces where they will be installed at least 48 hours in advance of installation.

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive products specified in this Section for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F (13 deg C).

B. Do not install products until they are at the same temperature as that of the space where they are to be installed.

C. Close spaces to traffic during installation of products specified in this Section.

1.08 SEQUENCING AND SCHEDULING

A. Sequence installing products specified in this Section with other construction to minimize possibility of damage and soiling during remainder of construction period.

1.09 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage, and identified with labels clearly describing contents.
   1. Furnish not less than 10 linear feet for each 500 linear feet or fraction thereof of each different type and color of resilient wall base installed, on a continuous roll. One roll per color.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following including:
   1. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Tarkett
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Roppe Corporation
      b. Flexco Div., Textile Rubber Co.

2.02 RESILIENT WALL BASE

A. Vinyl Wall Base: Products complying with FS SS-W-40, Type I, and requirements specified in the Rubber Wall Base Product Data Sheet at end of this Section.

2.03 RESILIENT ACCESSORIES

A. Vinyl Accessories: Products complying with requirements specified in Vinyl Accessory Product Data Sheet at end of this Section.

2.04 INSTALLATION ACCESSORIES

A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland- cement-based formulation provided or approved by flooring manufacturer for applications indicated.

C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient flooring product and substrate conditions indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas where installation of products specified in this Section will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section.

3.02 PREPARATION

A. General: Comply with manufacturer's installation specifications for preparing substrates indicated to receive products indicated.

B. Use trowelable leveling and patching compounds per manufacturers directions to fill cracks, holes, and depressions in substrates.

C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.

D. Broom and vacuum clean substrates to be covered immediately before installing products specified in this Section. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.03 INSTALLATION

A. General: Install products specified in this Section using methods indicated according to manufacturer's installation directions.

B. All work required to put the wall and floor surface into acceptable condition to receive the specified products shall be the full responsibility of the installer. All surfaces shall be prepared to prevent the telegraphing of irregular substrate conditions onto/through the surface of the new wall base or other accessories.

C. Apply resilient wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as practicable. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

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

2. Install inside and exterior corners before installing straight pieces.
3. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.
4. Form outside corners on job from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base and only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of wall base.

D. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.

E. Install reducer strips at edges of flooring that otherwise would be exposed. All dissimilar flooring products shall receive transition strips unless otherwise noted.

3.04 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing installation:
1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers of resilient product involved.
2. Sweep or vacuum floor thoroughly.
3. Do not wash materials until after time period recommended by manufacturer.
4. Damp-mop resilient accessories to remove black marks and soil.

B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.

C. Clean products specified in this Section not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products using method recommended by manufacturer.

3.05 VINYL WALL BASE PRODUCT DATA SHEET

Vinyl Wall Base Designation: (RB1)

Style: Cove with top-set toe

Minimum Nominal Thickness: 1/8"

Height: 4"

Lengths: Coils in lengths standard with manufacturer, but not less than 100 feet

Exterior Corners: Pre-molded or formed on job

Interior Corners: Pre-molded or formed on job

Ends: Pre-molded

Color and Pattern: As selected by Architect/Designer from manufacturer's full range of colors and patterns produced for vinyl wall base complying with requirements indicated.

3.06 VINYL ACCESSORY PRODUCT DATA SHEET

Vinyl Accessory Designation: Resilient Edge Strips

Profile and Dimensions: 1/8" thick, homogeneous rubber composition, tapered or bullnose edge.

Color: As selected by Architect/Designer from manufacturer's full range of colors produced for rubber accessories complying with requirements indicated.

END OF SECTION

SECTION 096723
RESINOUS DECORATIVE FLAKE EPOXY FLOORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnish and install the decorative epoxy flooring system as specified and indicated. Prior to installation, provide decontamination, shot-blasting or mechanically abrade existing floor finish and cleaning as specified. The term "decorative flake epoxy flooring system" as used in this section will include the primers, resin systems and flake materials, topcoats, and any related materials for the project.

B. Complete the decorative flake epoxy flooring system installation in strict accordance with these specifications, the coating system manufacturer's most current requirements for surface preparation, application and inspection, and the instructions for safety. In the event of a conflict between these specifications and the manufacturer's instructions, the more stringent requirements will apply.

C. The Contractor shall be responsible for providing ventilation, initial cleaning, inspection, supervision, dust control and equipment protection as specified herein and related sections for the work associated with this Section. The Contractor is responsible for all other work associated with this Section including protection of existing equipment and structures in the work area, surface preparation, flooring application, curing, coating repair, rework, inspection and supervision.

1.02 RELATED REQUIREMENTS

A. Section 033000-Cast-In-Place Concrete

B. Section 090050 - Finish Legend

1.03 DEFINITIONS

A. Terms used in this Section are defined as follows:
1. Decorative Flake Epoxy- The aspects involved with proper application Flooring Work of the specified high solids flooring system, including but not limited to cleaning, surface preparation, mixing, application, curing, and quality control.
2. Approved Materials- The coating system, blast media, and other specified materials for this coating work.
3. Wet Film Thickness- The primer or coating films' actual thickness immediately following application. Wet film thickness is measured in mils or thousandths of an inch (0.001") and is abbreviated WFT.
4. Dry Film Thickness- The primer or coating films' actual thickness
   a. following curing and drying. Dry film thickness is measured in mils or thousandths of an inch (0.001") and is abbreviated DFT.
5. Coating System- Refers to the approved coating Manufacturer Manufacturer abbreviated as CSM in this Section.
6. Manufacturer's Technical- Refers to the technical representative(s) of
   a. the Representative(s) approved CSM.
7. A/E- Architectural or Engineering Firm.

1.04 REFERENCE STANDARDS

A. Society for Protective Coatings (SSPC) Specifications and Standards:
1. SSPC-PA-3: "A Guide to Safety in Paint Application".
2. SSPC-SP-13: "Surface Preparation of Concrete".

B. NACE (National Association of Corrosion Engineers)
1. NACE Publication 6D-173, "A Manual for Painter Safety".
2. NACE Publication 6G-164, "Surface Preparation Abrasives for Industrial Maintenance Painting".

C. ASTM (American Society for Testing and Materials)
1. ASTM D4541 - L.R. “Standard Method for Pull-Off Strength of Coatings using Portable Adhesion Testers”.
2. ASTM E337 - L.R. “Standard Practice Test Method for Measuring Humidity with a Psychrometer”.
3. ASTM D4263-83 (1999), “Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method”.
4. ASTM F1869-98, “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”.
5. ASTM D4414-95, “Standard Practice for Measurement of Wet Film Thickness by Notched Gages”.
6. ICRI Guide No. 03732, “Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays,” International Concrete Repair Institute, Sterling, VA.
7. ASTM 4262, “Standard Test Method for Measuring Surface pH of Acid Etched Concrete”.
8. ASTM D4259, “Standard Practice for Abrading Concrete”.

1.05 SUBMITTALS

A. Submit the following prior to commencing with any phase of the work covered by this Section:
1. Manufacturer’s current printed recommendations and product data sheets for all decorative flake epoxy flooring system products including performance criteria, surface preparation and applications, volatile organic compound (V.O.C.) data, and safety requirements.
2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all coating system materials, solvents, and abrasive blast media.
3. Contractor’s written verification that the personnel who will perform this work have the required experience as specified in 1.05 1.9. This document must list the names of all of the Contractor’s supervisors and tradespeople who will work on the project covered by this Section.
4. List of cleaning and thinner solutions allowed by the CSM.
5. Storage requirements including temperature, humidity, and ventilation for Coating System Materials.

B. Owner, contractor, and manufacturer’s representative shall review and mutually agree upon color, grade, and final texture of coating system before starting installation. The acceptance of a sample will constitute the job standard by which installation will proceed. The approved sample will be kept at the job site and referred to at completion of the project for final approval of the floor.

C. Manufacturer certificate, located in the FOP, to be submitted with the bid, for the proposed decorative flake epoxy flooring system confirming that the decorative flake epoxy flooring system installer is approved to install the proposed decorative flake epoxy flooring system.

1.06 QUALITY ASSURANCE

A. The Contractor shall meet the following requirements:
1. The Contractor is ultimately responsible for the workmanship and quality of the decorative flake epoxy flooring system installation. Inspections by the Owner, Interior Designer, Architect, the Engineer, or others do not limit the Contractor’s responsibility.
2. Do not use or retain contaminated, outdated, or diluted materials for flooring. Do not use materials from previously opened containers.
3. Use only products of the approved CSM. Provide the same products for repairs as for the original coating.
4. If any requirements of this specification are contradicted by a referenced standard or vice-versa, the matter shall be resolved in writing by the A/E or its representative.
5. Make available at all times all locations and phases of the work for access and inspection by the Engineer, the Owner, or other personnel designated by the Owner. The Contractor shall

provide ventilation, egress, and whatever other means are required for the Owner, Engineer, or designated personnel to access and exit the work areas safely.

6. Conduct work so that the decorative flake epoxy flooring system is installed as specified herein. Inspect work continually to ensure that the coating system is installed as specified herein. The A/E shall inspect the work to determine conformance with the contract documents.
7. The Contractor's Supervisor shall be on site at all times and will be thoroughly familiar with the work in progress. This Supervisor shall have authority to receive and execute all direction provided by the A/E or the Owner.
8. The methods of construction shall be in accordance with all requirements of this specification and the best trade practices. Any changes in the decorative flake epoxy flooring system installation requirements shall be allowed only with the written approval of the A/E.
9. Installation shall be performed by an applicator having satisfactory experience in the application of these or similar materials or with on-site consultation by a qualified field service representative of the product's manufacturer. Provide a Letter of Reference from the product manufacturer stating quality of the installer's past installations.

1.07 PRE-INSTALLATION MEETING

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.08 MOCK-UP

A. Apply mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Provide up to 3 mockups for each grit finish RF1

B. Apply full thickness mock-ups on 48-inch square floor area selected by Architect/Interior Designer.
   1. Include 48-inch length of integral cove base.

C. Simulate finished lighting conditions for Architect/Interior Designer's review of mock-ups.

D. Approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Material shall be delivered to project site in manufacturer's original unopened containers.

B. Materials shall be stored indoors, protected from damage, moisture, direct sunlight and temperatures below 40 degrees F or above 90 degrees F.

C. Store all materials only in area or areas designated by the Owner solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of coating materials related debris before authorized disposal, to these areas. All materials are to be stored on pallets or similar storage/handling skids off the ground.

D. Mix all coating materials in a designated enclosed mixing area. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.

E. Do not use drain piping for disposal of coating materials.

F. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the decorative flake epoxy flooring system materials as described on the pertinent Material Safety Data Sheets or container labels.

G. Deliver all materials to the job site in new, unopened containers. Each container shall bear the CSM's name and label.
   1. Labels on all material containers must show the following information:
      a. Name or title of product.
      b. Manufacturer's batch number.
      c. Manufacturer's name.
      d. Generic type of material.
      e. Application and mixing instructions.
      f. Hazardous material identification label.
      g. Shelf life date.
   2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.
   3. All materials shall be handled and stored to prevent damage or loss of label.
   4. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

1.10 PROJECT CONDITIONS

A. Site Requirements
   1. Application may proceed while air, material and substrate temperatures are between 60F and 90F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
   2. The relative humidity in the specific location of the application shall be less than 85% and the surface temperature shall be at least 5 F above the dew point.
   3. The Applicator shall ensure that adequate ventilation is available for the work area.
   4. Do not apply coating materials when dust is being generated.
   5. If existing facility lighting is not adequate for flooring system application, the Contractor shall provide all temporary lighting during the work equivalent to one 200-watt explosion proof incandescent lamp per 100 square feet of work area.

B. Conditions of new concrete to be coated with epoxy material.
   1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of twenty eight days in accordance with AC1-308 prior to the application of the coating system pending moisture tests.
   2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary or desirable).
   3. Sealers and curing agents should not be used.
   4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements
   1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
   2. "No Smoking" signs shall be posted at the entrances to the work area.
   3. The Owner shall be responsible for the removal of foodstuffs from the work area.
   4. Non-related personnel in the work area shall be kept to a minimum.

1.11 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.12 WARRANTY

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

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following including:
   1. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Terroxy Resinous Flooring , Terrazzo & Marble Supply
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect:
      a. Dur-A-Flex, Inc.
      b. TNEMEC Co. Inc
      c. Dudick, Inc.
      d. Key Resin Co.
      e. Florock
      f. Terrazzo and Marble Supply
      g. Sherwin Williams General Polymers.
      h. Additional Manufacturers: Other manufacturers proposed which meet the specific standards specified, shall submit actual samples and specifications for review to the Designer/Architect not less than seven (7) days before the bid date.

2.02 SYSTEM DESCRIPTION

A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self -leveling seamless flooring system(as required) with decorative chip broadcast and topcoats.

B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 3/16 inch. It shall be applied to the prepared area (s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

C. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted.

2.03 FLOORING SYSTEM

A. Terroxy Resinous, Epoxy-Based seamless flooring system & cove base.
   1. System Materials:
      a. Primer: Terroxy Primer
      b. Membrane: Terroxy Iso Crack Membrane
      c. First Broadcast Coat: Terroxy Industrial Coating
         1) Chips: Mosaic Vinyl Flakes
      d. Second Broadcast Coat: Terroxy UV Clear
         1) Chips:Flake
      e. Grout coat: Terroxy UV Clear Grout Coat
      f. Topcoat: Terroxy Purify Top Coating, hardener and grit
   2. Patch - Leveling Materials
      a. Fill, Patching and Sloping Material (over 1/4 inch): Use Terroxy Urethane Cement

2.04 ACCEPTABLE INSTALLATION CONTRACTORS

A. Martina Brothers. Lexington, Ky, Home 859-255-3602

B. CSS Coatings, 3362 Industrial Drive Parkway, Bowling Green, KY 42101. Phone: 270-793-9069.

C. Quality Coatings of Indiana, 5202 W. Division Road, Morgantown, IN 46160-8420. Phone: 317-422-8059.

D. Superior Industrial Floor Coatings, 10660 Old State Road, Tell City, IN 47586. Phone: 812-547-6272. Cell: 812-449-0167

E. Dixon Coatings, 1117 14th Street, Columbus, IN 47201. Phone: 812-376-0230. Contact: Bill Dixon

F. Desco Floor Coatings, 1851 East Broadway, Fortville, IN 46040. Phone: 317-376-0230. Contact: Lee Reasor.

G. J. Wesselman Specialty Flooring, 173 Pelly Rd, Independence, KY 41051. Phone: 859-212-0959.

H. Epoxy Systems International, 5640 Morgan Rd, Cleves, OH 45002. Phone: 513-924-1800.

I. Invision Flooring Solutions (IVC), 11341 Decimal Drive, Louisville, KY 40299. Phone: 502-261-8283.

J. Additional Installers: Other manufacturers proposed which meet the specific standards specified, shall submit actual samples and specifications for review to the Designer/Architect not less than seven (7) days before the bid date.

2.05 PRODUCT REQUIREMENTS

A.	Primer		Terroxy Primer
	1.	Percent Solids	100%
	2.	VOC	-
	3.	Bond Strength to Concrete ASTM D 4541	350 psi, substrate fails
	4.	Hardness, ASTM D 3363	3H
	5.	Elongation, ASTM D 2370	10%
	6.	Flexibility (1/4: Cylindrical mandrel), ASTM D 1737	Pass
	7.	Impact Resistance, MIL D-2794	>160
	8.	Abrasion Resistance ASTM D 4060, CS 17 wheel, 1,000 g Load	30 mg loss
	9.	Mix	250 sf. per mixed gal. / 6.4 mils
B.	Membrane		Terroxy Iso-Crack Epoxy
	1.	Percent Solids	100%
	2.	VOC	-
	3.	Bond Strength ASTM C-1583-04	350 psi minimum
	4.	Tensile Strength, ASTM D 368	1200 psi
	5.	Elongation Strength ASTM D-412	140-160%
	6.	Hardness ASTM D-2240	70-80
	7.	Flame Spread/NFPA-101, ASTM E 84	Class A
	8.	Impact Resistance ASTM D-2794	16ft lbs
	9.	Hydrostatic Pressure ASTM C-1306	Pass 45 psig
	10.	Potlife @ 75 F	30 minutes
	11.	Mix	40 sf per mix gal/ 40mils
C.	Broadcast Coat		Terroxy Industrial Coating
	1.	Percent Solids	100%
	2.	VOC	59 g/L
	3.	Compressive Strength, ASTM C 579	14,500 psi
	4.	Tensile Strength, ASTM C 307	2,000psi
	5.	Flexural Strength, ASTM D 790	4,000 psi
	6.	Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles	35 mg loss
	7.	Flame Spread/NFPA-101, ASTM E 84	Class A

8.	Impact Resistance MIL D-3134		0.025 inch Max	
9.	Water Absorption. MIL D-3134		Pass	
10.	Potlife @ 70 F		20-25 minutes	
D.	Broadcast Coat and Grout Coat		Terroxy UV Clear	
1.	Percent Solids		100%	
2.	VOC		3.8 g/L	
3.	Compressive Strength, ASTM D 695		11,200 psi	
4.	Tensile Strength, ASTM D 368		2,100 psi	
5.	Flexural Strength, ASTM D 790		5,100 psi	
6.	Abrasion Resistance, ASTM D 4060			
	C-10 Wheel, 1,000 gm load, 1,000 cycles		29 mg loss	
7.	Flame Spread/NFPA-101, ASTM E 84		Class A	
8.	Impact Resistance MIL D-24613		0.0007 inches, no cracking or delamination	
9.	Water Absorption, MIL D-24613		Nil	
10.	Potlife @ 70 F		20 minutes	
E.	Topcoat		Terroxy Purify Topcoat	
1.	Percent Solids		95%	
2.	VOC		0 g/L	
3.	Tensile Strength, ASTM D 2370		7,000 psi	
4.	Adhesion, ASTM 4541		Substrate Failure	
5.	Hardness, ASTM D 3363		4H	
6.	60° Gloss ASTM D 523		70	
7.	Abrasion Resistance, ASTM D4060	Gloss	Satin	
	CS 17 Wheel (1,000 g load) 1,000 cycles	4	8	mg loss with grit
		10	12	mg loss without grit
8.	Pot Life, 70 F, 50% RH		2 hours	
9.	Full Chemical Resistance		7 Days	

PART 3 - EXECUTION

3.01 GENERAL

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
   1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

B. Protection
   1. Mask, cover, or otherwise protect all surfaces, equipment, and finishes not to receive the decorative epoxy flooring system specified in this Section.

C. Strictly follow the approved CSM's written instructions and the requirements of this specification regarding all aspects of decorative flake epoxy flooring work including: mixing, application, recoat times and curing.

3.02 PREPARATION

A. General
   1. Existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
   2. Where floor material or paint exists in areas to receive flake epoxy shot-blast or mechanically abrade to remove materials, laitance, curing compounds, sealers and other contaminants to provide surface profile. (Reference ASTM D4269, ICRI CSP 1-3). Floor surface shall be prepared to receive flake epoxy.

3. In all areas, inlcuding where tile has been demo-ed, vacuum clean concrete to remove all dirt, dust and other loose materials.
4. There shall be no visible moisture present on the surface at the time of application of the system. Compresed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.
5. Mechanical surface protection
   a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minumum profile of CSP 3-4 as described by the International Concrete Repair Institute.
   b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
   c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
   d. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
   e. If any tiles are not adhered properly remove them and patch with epoxy per manufacturer instructions prior to installing the floor.
6. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufacturer's recommendations.

B. After mechanically abrading, verify that all surfaces are clean, dry and free of any contaminants, which could adversely affect the adhesion of the flooring system.

C. If between final surface preparation work and decorative epoxy flooring system application, contamination of the prepared and cleaned substrates occurs, recleaning shall be required until the requirements of this Section are met.

3.03 APPLICATION

A. The system shall be applied in six distinct steps as listed below:
1. Substrate Preparation
2. Priming
3. Crack Membrane
4. Slurry
5. First Broadcast coat application with first chip broadcast
6. Second broadcast coat with second chip broadcast
7. Grout coat application
8. Topcoat application
9. Extra Topcoat application requested for this application.

B. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.

C. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.

D. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.

E. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

F. Primer
1. The primer shall be Terroxy Primer that is mixed at the ratio of 1 part resin to 4 parts hardener per the manufacturer's instructions.
2. The primer shall be applied by 1/8 inch notched squeegee and back rolled at the rate of 250 sf/gal to yield a dry film thickness of 6.4 mils.

G. Crack Membrane
1. The crack membrane to supress reflective cracking shall be Terroxy Iso-Crack Epoxy Membrane
2. Apply Iso Crack Membrane over prepared substrate to produce full substrate coverage at 40 mils thickness.

H. Broadcast Coats
1. The broadcast coat shall be applied as a double broadcast system as specified by the Architect.
2. The broadcast coat shall be comprised of two components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener.
3. The resin shall be added to the hardener and thoroughly mixed by suitably approved mechanical means.
4. The first broadcast coat shall be applied over horizontal surfaces using the dip and roll, and black roll method at the rate of 100 sf/gal using the Terroxy Industrial Coating material.
5. Chips shall be broadcast to excess into the wet material, Macro chips at the rate of 0.1 lbs/sf.
6. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
7. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
8. Apply a second broadcast coat of resin shall be applied by flat squeege then back rolled with a coverage rate of 115 sf/gal with the Terroxy UV Clear Epoxy.
9. Chips shall be broadcast to excess, Macro chips at the rate of 0.1 lbs/sf.
10. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.
11. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.

I. Grout Coat
1. The grout coat shall be comprised of a Terroxy UV Clear epoxy that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
2. The grout coat shall be squeegee applied and back rolled with a coverage rate of 100 sf/gal.

J. Topcoat
1. The topcoat of Terroxy Purify shall be roller applied at the rate of 400 sf/gal to yield a dry film thickness of 4 mils.
2. The finish floor will have a nominal thickness of 60 mils.

K. Color and size of Flake: Color TBD to match architects sample w/ various sized flake to achieve "Terrazzo Look"

L. Texture: Medium texture with no additional aggregate matching architects sample in Restroom areas. Heavy texture with Aluminum Oxide in the Wash area to match architects sample.

3.04 CLEANUP

A. Remove waste materials, rubbish, and debris and dispose of them at the owner’s direction. Leave work areas in a clean and tidy condition.

3.05 PROTECTION

A. Protect the completed work from water, airborne particles or other surface contaminants until cured for a minimum of 24 hours after application.

B. Protect from traffic, physical abuse, immersion and chemical exposure until the complete system has thoroughly cured for 24 hours at 75 degrees F. For different temperatures, consult the manufacturer's representative about curing times.

3.06 FIELD QUALITY CONTROL INSPECTION AND TESTING

A. Inspection by the Architect/Interior Designer, Owner or others does not limit the Contractor's responsibilities for quality as specified herein or as required by the CSM's instructions.

B. The Contractor shall perform the Q.C. procedures listed below in conjunction with the requirements of this Section. The Architect/Interior Designer will inspect the work to determine conformance to the contract documents.

1. Degree of Cleanliness.
   a. Visually inspect the degree of cleanliness of substrates to meet the requirements of this Section. The pH of the concrete substrates will be measured using pH-indicating papers. PH testing is to be performed once every 100 sq. ft. of surface area to be coated.
   b. Acceptable pH values shall be between 8.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Chek Jumbo 0-13 or 1-12 or equivalent. The paper shall be touched to the surface once using moderate finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.
   c. Note: If the surface of the concrete is dry, it is not possible to take a pH measurement. However, pH values are still important on dry surfaces. When a dry concrete substrate is encountered for a pH test, the surface where the pH test is to be performed shall be sprayed lightly with distilled, deionized water from a commercially available spray bottle that has been properly rinsed to preclude any dissolved solids. The spray shall just wet the surface to a "shiny" appearance. Wait 60 seconds to allow chemical equilibria to be established and then test the pH of the water on the surface. Perform this test in accordance with ASTM D4262.
2. Concrete Surface Profile
   a. Using the replicate rubber specimens inspect the concrete surface profile in accordance with ICRI Guide No. 03732. This should be performed once for every 1,000 square feet of surface area to be coated.
3. Measure and record ambient air temperature once every two hours of each shift using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.
4. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.
5. Inspect correct mixing of coating materials in accordance with the CSM's instructions.
6. Inspect and record that the "pot life" of coating materials used are not exceeded during installation.
7. Measure and record the thickness of the coating system using a notched gauge in accordance with ASTM D4414 for Wet Film Thickness at least once every 10 sq. ft. of coating area.
8. Perform moisture tests on concrete as follows:
   a. Once for every 500 square feet of surface area to be coated, perform the plastic sheet test in accordance with ASTM D4263. If moisture is indicated, proceed to step 2 below.
   b. Perform calcium chloride moisture tests in accordance with ASTM D1869 once for every 1000 square feet of surface area to be coated. The maximum limit for moisture vapor emissions rate should be 3.0 lbs. per 24 hours per 1000 sq. ft. If tests indicate rates higher than 3.0, consult with Tnemec's Technical Service Department for further evaluation.

9. Inspect to verify proper curing of the decorative flake epoxy flooring system as recommended by the CSM.

END OF SECTION

SECTION 096813
CARPET TILE AND BASE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes modular, tufted carpet tile (CPT1)

B. Sections 096500 thru 096513 and 096813 thru 096816 shall not be combined with any other bid packages. The installer must be CFI certified (C-2 level or higher). A certified person should be on the job at all times during the installation procedures.

1.02 RELATED REQUIREMENTS

A. Section 090050 - Finish Legend

B. Section 096513 - Resilient Wall Base and Accessories, for resilient wall base and accessories installed with carpet tile

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement (replaced SG-971)

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009

I. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition

1.04 SUBMITTALS

A. Product Data: For each type of product indicated, include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.

B. Shop Drawings: Show the following:
1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles
2. Carpet tile type, color, and dye lot
3. Pattern of installation
4. Pattern type, location, and direction
5. Pile direction
6. Type, color, and location of edge, transition, and other accessory strips
7. Transition details to other flooring materials

C. Samples: For each of the following products and for each color and texture required, label each sample with manufacturer's name, material description, color, pattern, and designation indicated on drawings and in schedules.
   1. Carpet Tile: Full-size sample
   2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long samples.

D. Product Schedule: For carpet tile, use same designations indicated on drawings.

E. Qualification Data: Installer must be CFI Certified (C-2 level or higher).

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.

G. Maintenance Data: For carpet tiles to include in maintenance manuals, include the following:
   1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule
   2. Precautions for cleaning materials and methods that could be detrimental to carpet tile

H. Warranty: Special warranty specified in this section.

I. Manufacturer certificate, located in the FOP, to be submitted with the bid, for the proposed carpet flooring system confirming that the carpet flooring system installer is approved to install the proposed carpet flooring system.

1.05 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104, Section 4, "Storage and Handling."

1.07 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Ambient Temperature and Humidity Suitable Substrates" and Section 7.3, "Ventilation."

B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.09 WARRANTY

A. When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with Division 1 Section "Product Requirements."

B. Revise paragraph and subparagraphs below if manufacturers have separate warranties for various characteristics.

C. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, and delamination.
   3. Warranty Period: 10 years from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Carpet Tile: Full-size units equivalent to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m)

PART 2 -PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Patcraft
   2. Shaw Commercial
   3. J&J Flooring

B. Available Manufacturers: Other manufacturers proposed which meet the specific standards specified, shall submit actual samples and specifications for review to the Designer/Architect not less than seven (7) days before the bid date.

2.02 CARPET TILE(CPT 1)

A. Products: Subject to compliance with requirements, provide one of the following Basis of Design selections:

B. Manufacturer: Patcraft

C. Collection: Crafted Surface

D. Style: Overlayer

E. Style number: 00540

F. Color: Taupe Tuft

G. Fiber Content: 100% bEco Solution Q Link

H. Pile Characteristic: 3.18mm

I. Total Thickness: 6.73mm

J. Gage: 1/12 inches

K. Surface Pile Weight: 22 oz

L. Primary Backing: Non Woven Synthetic

M. Secondary Backing: Ecoworx

N. Size: 18 by 36 inches

2.03 CARPET TILE ADDITIONAL REQUIREMENTS

A. Applied Soil-Resistance Treatment: Manufacturer's standard material

B. Antimicrobial Treatment: Manufacturer's standard material

C. Performance Characteristics: As follows:
1. Colorfastness to Light:

D. Flammability, Methenamine Pill Test (DOC FF-1-70): Passes

E. Flooring Radiant Panel (ASTM E-648): Class 1

F. Smoke Density (ASTM E-662): Less than 450

G. Wearability: Lifetime Commercial Wear Warranty

H. Edge Ravel/Zippering: Lifetime Warranties

I. Backing Integrity/Delamination: Lifetime Warranties

J. Traffic Class: Heavy

K. CRI Green Label:

L. ADA Compliance: This product meets the guidelines as set forth in the Americans with Disabilities Act for minimum static coefficient of friction of 0.6 for accessible routes.

2.04 ACCESSORIES

A. Carpet Edge Guard: Extruded aluminum carpet bar model No. MT-00-A as manufactured by Johnsonite (or approved equivalent). Extruded T-Moulding cap strip profile specifically made to transition between materials as manufactured by Johnsonite (or approved equivalent).
1. Manufacturers: Subject to compliance to specifications, provide products as manufactured by one of the following:
a. Futura Home Products
b. William L. Bonnell Co., Inc.
c. Macklanburg - Duncan
d. Mercer Products Co., Inc.
e. Flexco Division, Textile Rubber Co.
f. Roppe
g. Johnsonite, Inc.

B. Carpet Adhesive: Water resistant, up to 99% RH and non-staining as recommended by carpet manufacturer to comply with flammability requirements for installed carpet.

2.05 INSTALLATION ACCESSORIES

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

B. Adhesives: Pressure Sensitive Adhesive System. CRI Green Label Plus certified and recommended by carpet tile manufacturer for releasable installation. Water resistant up to 99% RH and non-staining as recommended by the carpet manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

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

3.02 PREPARATION

A. General: Comply with CRI 104, Section 7.0 "Site Conditions" and to Section 8.0 "Substrate Preparation" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.

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

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

3.03 INSTALLATION

A. General: Comply with CRI 104, Section 10 "Carpet Tile" and with carpet tile manufacturer's written installation instructions.

B. Installation method, layout: Ashlar

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

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

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

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

G. Install pattern parallel to walls and borders.

3.04 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:
1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with CRI 104, Section 11, "Post Installation".

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

END OF SECTION

SECTION 096813.01
CARPET TILE INSTALLER'S CERTIFICATION

PART 1 GENERAL

1.01 CARPET TILE INSTALLER'S CERTIFICATION

This certification must be completed and submitted as outlined in the Supplemental Instructions to Bidders. Failure to submit this completed certification may be cause for rejection of the bidder's proposal.

Date Submitted:_____

Name & Address of Carpet Tile Installer:

_____

_____

_____

I certify that _____ (Name of Carpet Tile Installer) has achieved CFI Certification for carpet installation.

CFI Number_____

Signed:_____Title: _____

END OF SECTION

SECTION 097726
PRINTED DISPLAY MATERIALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 9 Section 090050 - Finish Legend

1.02 SUMMARY

A. This Section includes the following: Printed display materials for installation on concrete masonry material surfaces.
   1. Wall-mounted printed display
      a. Printing Method: Direct substrate printing utilizing HPLX 600 UV Printer
      b. Substrate: Arlon DPF 6700 Vinyl Film Cast wall wrap film with over laminate, 2-mil (50 micron) cast highly conformable film
      c. Image: High Resolution PDFs will be provided by Owner. Single-sided printing required.
      d. Over Laminate: Arlon Series 3220 Overlaminates, 2-mil (50 micron) cast vinyl film
         1) Sheen: gloss, luster, satin, and matte
      e. Location: See drawings
      f. Mounting: Mount graphics directly on concrete masonry material surfaces.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Product Data: Indicate features, product type and construction, material attributes and mounting details.
   2. Detail fabrication and installation of the printed display items and hardware. Include printed strike-off, and details of hardware components and their connections.
   3. Samples: Submit one 1'-0" x 1'-0" approx. sample of printed material with example graphic illustrating product material design, color capabilities and finish.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing printed display materials similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver printed display materials wrapped in protective coverings and strapped together in suitable packs or in heavy-duty cartons.

B. Store products on elevated platforms in a dry location.

1.06 PROJECT CONDITIONS

A. Field Measurements: Where printed display materials are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with printing without field measurements. Coordinate cutting of materials to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equivalent:
   1. ASI Signage Innovations
   2. Fastsigns of Louisville
   3. Lynn Imaging

2.02 APPROVED INSTALLATION CONTRACTORS

1. ASI Signage Innovations

2. Fastsigns of Louisville

3. Lynn Imaging

A. Available Installers: Graphics must be installed by a 3M preferred installer who has been trained by 3M in the proper AACM techniques to reduce the risk of vinyl failure on low/no voc painted walls. Other installers proposed which meet the specific training standards required and have successfully completed installation for five years plus, shall submit their references not less than seven days prior to the bid date.

2.03 MISCELLANEOUS MATERIALS

A. Fasteners (if required): Use fasteners fabricated from same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
   1. Provide concealed fasteners for interconnecting formed-metal fabrications and for attaching them to other work, unless otherwise indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates for compliance with requirements for moisture content and other conditions affecting performance of Work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation, including the proper AACM techniques to reduce the risk of vinyl failure on low/no VOC painted surfaces.

B. Clean substrates of substances that could impair wall covering's bond, including mold, mildew, oil, grease, incompatible primers, and dirt.

C. Check painted surfaces for pigment bleeding.

D. Acclimatize vinyl film materials if required by removing them from packaging in the installation areas not less than 24 hours before installation.

3.03 INSTALLATION, GENERAL

A. General: Comply with vinyl film manufacturers' written installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Install vinyl film with no gaps or overlaps.

C. Install seams vertical and plumb at least 6 inches (150 mm) from outside corners and 3 inches (75 mm) from inside corners. No horizontal seams.

D. Remove air bubbles, wrinkles, blisters, and other defects.

E. Trim edges for color uniformity, pattern match, and tight closure at seams and edges. Butt seams.

3.04 CLEANING

A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended by vinyl film manufacturer.

C. Replace strips that cannot be cleaned.

3.05 PROTECTION

A. Protect finishes from damage during construction period. Remove temporary protective coverings at time of Substantial Completion.

END OF SECTION

SECTION 099000
PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 RELATED REQUIREMENTS

A. Section 015721 - Indoor Air Quality Management

B. Section 055000 - Metal Fabrications: Shop-primed items

C. Section 055100 - Metal Stairs: Shop-primed items

D. Section 090050 - Finish Legend

E. Section 101100 - Visual Display Surfaces

F. Section 220553 - Identification for Plumbing Piping and Equipment: Painted identification

G. Section 260553 - Identification for Electrical Systems: Painted identification

H. Section 321723.13: Pavement markings

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency

B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications

C. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials

D. GreenSeal GS-11 - Paints

1.04 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items including surface preparation and primer.
   1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. VOC data: Submit Green Seal GS-11 and/or GC-03 compliance documents and description of the basis for compliance.

C. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

D. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
   1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
   2. All exposed to view (from the ground) flashing are to be furnished prefinished where available. If items are not available prefinished, they are to be painted. Coordinate with Contractor on these items.

3. Exposed copper piping shall receive a painting system.
4. **It shall be the full responsibility of the painter to verify all paint, types to determine if paint(s) system specified are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by painter/manufacturer based on testing and field experience. All existing painted surfaces shall be tested to ensure product compatibility and to ensure that the paint bonds will not fail.**
5. Painting shall include field painting pre-finished grilles, registers and diffusers located on gypsum board ceilings and soffits, which are to receive an accent paint color.
6. Painting shall include field painting of drywall grid ceiling system (black), clips, wires, etc. in multipurpose room
7. Painting shall include field painting of clips, wires, etc. used to suspend acoustical ceiling components, which are exposed after construction is complete.
8. Painting shall include field painting exposed unfinished countertop and shelving brackets.
9. Exterior items to receive a painting system include but are not limited to the following:
    a. Fixed access ladders
    b. Elevator pit ladders
    c. Ships ladders
    d. Walk-through ladders
    e. Roof ladders
    f. Ladder security guard
    g. Bollards
    h. Lintels
    i. Door frames for overhead doors and wall openings
    j. Elevator sump pit cover
    k. Folding/disappearing stairway ie the door and frame
    l. Handrails
10. Where the Room Finish Schedule calls for a new paint system (P#) New painting shall include all previously painted items including but not limited to door & window frames, doors, conduit, HVAC components, etc.

E. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
1. Prefinished items include the following factory-finished components:
    a. Architectural woodwork
    b. Elevator entrance doors and frames
    c. Elevator equipment
    d. Finished mechanical and electrical equipment
    e. Light fixtures
2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
    a. Furred areas
    b. Ceiling plenums
    c. Pipe spaces
    d. Duct shafts
3. Finished metal surfaces include the following:
    a. Anodized aluminum
    b. Stainless steel
    c. Chromium plate
    d. Bronze and brass
4. Operating parts include moving parts of operating equipment and the following:
    a. Valve and damper operators
    b. Linkages
    c. Sensing devices
    d. Motor and fan shafts
5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.05 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
   1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
   4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.

C. Manufacturer's Instructions: Indicate special surface preparation procedures.

D. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

E. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960.

F. Product Data: For each paint system indicated. Include primers.
   1. When proposing another manufacturers product other than product specified, a complete cross-reference list must be included with the submittal. Shop drawings will be automatically returned if the list is not included.
   2. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
   3. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

G. Samples for Initial Selection: For each type of finish-coat material indicated.
   1. After color selection, Architect will furnish color chips for surfaces to be coated.
   2. The painter is required to submit drawdowns of each paint color for review of color and sheen match.

1.07 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
   1. Product name or title of material
   2. Product description (generic classification or binder type)
   3. Manufacturer's stock number and date of manufacture
   4. Contents by volume, for pigment and vehicle constituents
   5. Thinning instructions

6. Application instructions
7. Color name and number
8. VOC content

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.09 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).

B. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

C. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 EXTRA MATERIALS

A. See Section 016000 - Product Requirements, for additional provisions.

B. Supply 1 gallon of each color; store where directed.

C. Label each container with color in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles or approved equivalent as manufactured by one of the following manufacturers.

C. Paint Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
1. ICI Paints & Devoe High Performance Coatings (ICI)
2. Sherwin-Williams Co. (Sherwin-Williams)
3. Coronado Paint Company (Coronado)
4. PPG Paints, Inc. (Pittsburgh & Porter Paints)
5. Farrell Calhoun Paint

D. Toxicity/IEQ: Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.
1. Interior paint: Comply with GS-11
2. Exterior paint: Comply with GS-11

E. Specialty Coatings:
1. Manufacturer: IdeaPaint, 40 Broad Street, 1st Floor, Boston, MA 02109, telephone 617-714-1050, fax 617-714-1078, website www.ideapaint.com

2. Dry Erase Coating: IdeaPaintTM PRO, 2-part, solvent-based coating by IdeaPaint, providing a surface suitable for use of dry-eraser markers.
3. Color: Manufacturer's standard color as follows:
   a. Color: To be selected from manufacturer's standards
4. VOX (EPA) Method 24 or ASTM D3960): 325 g/L
5. Coverage: 1 quart per 50 sf (4.6 sq. m)
6. Density (mixed) (ASTM D1475) 10.37 lbs/gal
7. Opacity/Hiding Power (ASTM D2805): 96%
8. Sag Resistance (ASTM D4400): 8
9. Flow and Leveling (ASTM D2801): 10
10. Crack Resistance (ASTM D522): 21%
11. Finish/Gloss (ASTM D523) on Dry Wall board:
    a. 20 degrees: 26.6
    b. 60 degrees: 71.0
    c. 85 degrees: 68.0
12. Scrub Resistance (ASTM D2486): Breakthrough at 15,600 Cycles
13. Stain Removal/Washability (ASTM D3450): >99.55%
14. QUV (ASTM D4587) Status after 500 hours:
    a. White Board: Brightness for White Board QUV = 91.44, DE = 2.01
15. Thermal: KCMA ANSI-A161.1-1995 Method 9.2, 26 cycle no cracking observed
16. Flashpoint (open cup) (ASTM D92): 338 degree F (170 degree C)
17. Flammability Limit: ASTM E682, lower flammability limit 1.69 percent at 212 degrees F (100 degrees C); upper flammability limit greater than 9.44 percent at 212 degrees F (100 degrees C)
18. Fire Rating (ASTM E84): Flame 5, Smoke 0 or Class 1 or Class A
19. Primer: Latex, stain blocking type, non-tinted, ie: Glidden TM Gripper or Kilz Premium
20. Roller Covers: 9" wide FoamPro roller cover by FoamPro - no substitutions

2.02 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
   1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

2.03 PAINTS AND COATINGS - GENERAL

A. Toxicity/IEQ: Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Paints and coatings applied on site shall comply with the following VOC content limits:
   1. Interior paint: Comply with GS-11
   2. Exterior paint: Comply with GS-11
   3. Flat: 50 g/L
   4. Non-flat: 150 g/L
   5. Anti-corrosive & anti-rust: 250 g/L
   6. Clear wood finishes, varnish: 350 g/L
   7. Clear wood finishes, lacquer: 550 g/L
   8. Floor Coatings: 100 g/L
   9. Shellac, Clear: 730 g/L
   10. Shellac, Pigmented: 550 g/L
   11. Waterproofing Sealer: 250 g/L

12. Sanding Sealer: 275 g/L
13. Sealers, Other: 200 g/L
14. Stains: 250 g/L

B. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Supply each coating material in quantity required to complete entire project's work from a single production run.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

C. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

D. Chemical Content: The following compounds are prohibited:
1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings)
2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride

2.04 PAINT SYSTEMS - EXTERIOR

A. Exterior Primers:
1. Exterior Concrete and Masonry Primer: Factory formulated alkali resistant acrylic latex primer for exterior application
   a. Sherwin-Williams Loxon Concrete & Masonry Primer LX02W0050 VOC 99 g/l 3.2 mils. DFT
   b. PPG Industries Perma-Crete Int/Ext Alkalie Resistant Primer 4-603VOC< 100 g/l
      Farrell Calhoun 697 100% Acrylic Bonding Masonry Primer/Stain Killer
   c. Benjamin Moore & Co. Products
      1) Concrete and Masonry, N068 Super Spec Masonry High Build Primer
2. Exterior Ferrous Metal Primer: Factory formulated rust inhibitive metal primer for exterior application.
   a. Sherwin-Williams Pro-Industrial Pro-Cryl Universal acrylic primer B66-310 series VOC less than 100 g/l 2.0-4.0 mils. DFT
      Farrell Calhoun Tuff-Boy 5-56 100% Acrylic All Purpose Metal Primer/Finish Coat
   b. PPG Industries Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912 series VOC <100 g/l
   c. Benjamin Moore & Co. Products
      1) Ferrous Metal, P06 Alkyd Metal Primer
3. Exterior Galvanized Metal Primer: Factory formulated galvanized metal primer for exterior application.
   a. Sherwin-Williams Pro-Industrial Pro-Cryl Universal acrylic Primer B66-310 series VOC less than 100 g/l 2.0-4.0 mils DFT
   b. PPG Industries Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912 series VOC <100 g/l
      Farrell Calhoun Tuff-Boy 5-56 100% Acrylic All Purpose Metal Primer/Finish Coat
   c. Benjamin Moore & Co. Products
      1) Galvanized Metal, P04 Acrylic Metal Primer
4. Exterior Wood Primer: Factory formulated wood primer for exterior application.
   a. Sherwin-Williams Exterior Latex Wood Primer, B42W08141 Series

b. Farrell Calhoun 235 Int/Ext 100% Acrrylic Latex Undercoater

B. Block Fillers:
1. Concrete Block & Masonry Surfacer.
a. Sherwin Williams Pro Industrial Heavy Duty Block Filler, B42W00150 Series
b. PPG Industries Perma-Crete Acrylic Latex (low temperature cure) Filler 4-100
c. Benjamin Moore & Co. Products
1) Concrete Block & Masonry Surfacer, 206 Super Spec Hi-Build Block Filler
d. Farrell Calhoun 470 Int/Ext Latex Masonry Block Filler

C. Exterior Finish Coats:
1. Exterior Semigloss Acrylic Enamel: Factory formulated semigloss waterborne acrylic_latex enamel for exterior application.
a. Sherwin-Williams Exterior Super Paint Latex Satin A89 Series VOC 114 g/l 1.44 mils DFT
b. PPG Industries Speedhide Exterior 100% Acrylic Semi-Gloss 6-900XI series VOC < 50 g/l
c. Farrell Calhoun Durashield 3400 Line 100% Acrylic Exterior Semi-Gloss
d. Exterior Semigloss Acrylic Semigloss, N449 Ultra Spec Exterior Gloss Finish
e. Benjamin Moore & Co. Products
1) Exterior Semigloss Acrylic Semigloss, N449 Ultra Spec Exterior Gloss Finish

D. Exterior Finish Coats - Metal: Factory formulated water based alkyd urethane enamel:
1. Sherwin Williams; Pro-Industrial Waterbased Alkyd Urethane B53-1050 series, gloss (B53-1150 semi-gloss, B53-1250 low sheen) VOC 50 g/l <0.42 lb/gal, wet mils 4.0 - 5.0, dry mils 1.4 - 1.7
2. PPG Industries Speedhide Exterior 100% Acrylic Semi-Gloss 6-900XI series VOC < 50 g/l
3. Farrell Calhoun Rust-Knox II DTM 2042 Line Int/Ext Satin Primer/Finish

E. Exterior Galvanized Metal shall receive two finish coats over a primer. Primer-PPG Porter Paint Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912 series or approved equal. Top Coats-PPG Porter Paint Speedhide Exterior 100% Acrylic semi-gloss 6-900XI Series or approval equal.

2.05 PAINT SYSTEMS - INTERIOR

A. Interior Primers:
1. Interior Concrete Primer: Factory formulated alkali resistant acrylic latex interior primer for interior application
a. Sherwin-Williams Pro Industrial Heavy Duty Block Filler
b. PPG Industries Speedhide Int/Ext Hi Fill Block Filler 6-15 VOC < 50 g/l
c. Farrell Calhoun 697 100% Acrylic Bonding Masonry Primer/Stain Killer
d. Benjamin Moore & Co. Products
1) Interior Concrete Primer, N068 Super Spec Masonry High Build Primer
2. Interior Gypsum Board Primer: Factory formulated latex based primer for interior application
a. Sherwin-Williams Promar 200 Zero VOC Latex Primer B28W2600 VOC 2 G/L 1.5 DFT
b. PPG Industries Speedhide Zero Latex Primer 6-4900 Zero VOC
c. Farrell Calhoun 475 Perfik-Kote Int High Build Latex Primer/Sealer
d. Benjamin Moore & Co. Products
1) Interior Gypsum Board Primer, N534 Ultra Spec 500 Interior Primer
3. Interior Ferrous Metal Primer: Factory formulated quick drying rust inhibitive alkyd based metal primer
a. Sherwin-Williams Pro-Industrial Pro-Cryl Universal acrylic Primer B66-1310 series VOC 110 g/l 2.0-4.0 mils DFT

b. PPG Industries Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912 series VOC < 100 g/l
c. Farrell Calhoun Tuff-Boy 1069 Rust-Stop Primers
d. Benjamin Moore & Co. Products
1) Interior Ferrous Metal Primer, P06 Alkyd Metal Primer

4. Interior zinc-coated metal primer: Factory formulated galvanized metal primer
a. Sherwin-Williams Pro-Cryl Universal Water Based Primer B66-310 Series VOC 110 g/l 2.0-4.0 mils DFT
b. PPG Industries Pitt-Tech Plus Int/Ext DTM Industrial Primer 90-912 series VOC < 100 g/l
c. Farrell Calhoun Tuff-Boy 5-56 100% Acrylic All Purpose Metal Primer/Finish Coat
d. Benjamin Moore & Co. Products
1) Interior Zinc-Coated Metal Primer, P04 Acrylic Metal Primer

B. Interior Finish Coats:
1. Interior Finish Coats - Stair And Ramp Railings: Factory formulated high solids, single pack acrylic polysiloxane:
a. PPG Industries PSX One High Solids, high gloss. Two (2) coats are required to act as a self-primer.
b. Sherwin Williams Sher-Loxane 800, B58W00501. VOC < 100 g/l wet mils 5.0 - 7.0, dry mils 4.0 - 6.0. Two (2) coats are required to act as a self-primer.
c. Farrell Calhoun Rustoleum Sierra S60 Water-Based Epoxy Maintenance Coating

2. Interior Finish Coats - Metal Excluding Stair and Ramp Railings: Factory formulated water based alkyd urethane enamel:
a. Sherwin Williams; Pro-Industrial, Waterbased Alkyd Urethane, number B53-1050 series, gloss (B53-1150 semi-gloss, B53-1250 low sheen) VOC 50 g/l <0.42 lb/gal, wet mils 4.0 - 5.0, dry mils 1.4 - 1.7
b. Benjamin Moore & Co. 79301 Advance waterborne interior alkyd semi-gloss
c. PPG Industries 1506-0110 Lifemaster Oil interior/exterior semi-gloss
d. Farrell Calhoun Rustoleum Sierra S60 Water-Based Epoxy Maintenance Coating

3. Interior Flat Acrylic Paint: Factory formulated flat acrylic emulsion latex paint for interior application
a. Sherwin-Williams Promar 200 Zero VOC Interior Latex Flat B30W2651 VOC 2 G/L 1.6 DFT
b. PPG Industries Speedhide Zero Interior Latex Flat 6-4110 series Zero VOC
c. Farrell Calhoun 300 Line Interior Premium Flat Latex Wall Paint
d. Benjamin Moore & Co. Products
1) Interior Flat Acrylic, N536 Ultra Spec 500 Interior Flat

4. Interior Semigloss Acrylic Enamel: Factory formulated semigloss acrylic latex enamel for interior application
a. Sherwin-Williams Promar 200 Zero VOC Interior Latex Semi-gloss B31W2600 Series 0 g/l 1.6 mils DFT. If using above product for trim areas, this is the more durable product.
b. PPG Industries Speedhide Zero Interior Latex Semi-Gloss 6-4510 series Zero VOC
c. Farrell Calhoun 600Line 100% Acrylic Interior Semi-Gloss Latex Enamel
d. Benjamin Moore & Co. Products
1) Interior Semigloss Acrylic Enamel, N539 Ultra Spec 500 Interior Semigloss

5. Interior Eggshell Acrylic Paint: Factory formulated eggshell acrylic latex paint for interior application:
a. Sherwin Williams Promar 200 Zero VOC Interior Latex Eggshell B20W2600 applied as a dry film thickness
b. PPG Industries Speedhide Zero Interior Latex Eggshell 6-4310 series Zero VOC
c. Farrell Calhoun 370 Line Interior Premium Eggshell Latex Enamel
d. Benjamin Moore & Co. Products

1) Interior Eggshell Acrylic Paint, N538 Ultra Spec 500 Interior Eggshell

6. Interior Gloss Acrylic Paint: Factory formulated gloss acrylic latex paint for interior application:
   a. Sherwin Williams Promar 200 Interior Latex Gloss B21W2250 Series VOC 2 G/L applied as a dry film thickness of 1.7 mils
   b. PPG Industries Speedhide Int/Ext 100% Acrylic Gloss 6-8534 series VOC <100 g/l
   c. Farrell Calhoun 4000 Linehigh Gloss Acrylic Latex Enamel
   d. Benjamin Moore & Co. Products
      1) Interior Gloss Acrylic Paint, N540 Ultra Spec 500 Interior Gloss
7. Interior Exposed Metal Decking and Bar Joists:
   a. PPG Industries Speedhide Super Tech WB Interior Dry-Fog 6-725XI, VOC < 100 g/l
   b. Sherwin - Williams Pro Industrial Waterborne Acrylic Dryfall - Flat, White B42W181 with subsequent coats only as required for complete, proper and full coverage
   c. Farrell Calhoun Tuff-Boy 999 Water-Base Dry Fall Flat
   d. Benjamin Moore & Co. Products
      1) Interior Expose Decking and Bar Joists, N110 Super Kote 5000 Dry Fall Latex Flat

C. Interior Concrete Floor Finish:

D. Interior Concrete Floor Sealer (SC1)
   1. PPG Industries Perma-Crete 4-6200 Plex-Seal WB interior/exterior clean sealer
   2. Sherwin-Williams H&C Concrete Wet Look Water Based

E. All walls, Gypsum board ceilings, metal deck, structural elements, conduit, all unfinished surfaces exposed after construction is complete shall receive a paint system unless noted otherwise.

F. All unfinished exterior surfaces including concrete block, steel lintels, etc. will receive a paint system. Refer to the specifications for additional information.

2.06 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler

C. Fastener Head Cover Material: Latex filler

PART 3 - EXECUTION

3.01 EXAMINATION

A. Test existing finishes for lead before sanding, scraping, or removing. If lead is present, conform to procedures applicable when hazardous or contaminated materials are discovered.

B. Substrate: Install formaldehyde-free MDF, particle board, or straw particle board.

C. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.
   1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
   2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

D. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

E. Indoor Air Quality: Provide temporary ventilation during work of this section.

F. Waste Management: As specified in Section 01351 - Waste Management and as follows:
   1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product. Close and seal all partially used containers of paint to maintain quality as necessary for reuse.

3.02 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
   1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
   2. **Required Surface Preparation:**
      a. **Step 1 - Dust wall and other surfaces to receive paint by working down with a dust mop, static duster, or feather duster.**
      b. **Step 2 - Clean surface with a mild detergent using a sponge or soft cloth. Avoid using cleaners containing alcohol on latex paint, as alcohol can dissolve and damage the paint film.**
      c. **Step 3 - Wash surfaces from the bottom up to avoid water running down the wall over the dirt.**
      d. **Step 4 - Rinse out the sponge in clean water until the cleaning solution is removed. Use the cleaned sponge to thoroughly rinse the washed area. Residual cleaner will interfere with adhesion of paint applied subsequently.**
      e. **Step 5 - Use a soft cloth or towel to blot excess water off the paint film.**
      f. **Refer to Item C below for additional requirements.**

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   2. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
      a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
      b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
      c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
   a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
   b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
   c. If transparent finish is required, backprime with spar varnish.
   d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
   e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery. Revise first subparagraph and associated subparagraphs below to suit Project.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
   a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

A. Low-Biocide Paint: Reduced shelf life. Products should be carefully evaluated for spoilage before applying. Comply with manufacturer's recommendations for storage and application.

B. Natural Plant- and Mineral-Based Finishes: Products may not perform or behave the same as conventional paints. Comply with manufacturer's recommendations for application.

C. Milk-Based Paint (Casein): Available in powdered form; add water and stir well. Transparency is controlled by amount of water. In powder form it has an indefinite shelf life. After mixing, do not keep beyond recommended shelf life (to avoid spoilage).

D. Paint Strippers: Compounds that do not contain methylene chloride tend to be slower-acting than conventional paint strippers and may take from one hour to overnight to work. Comply with manufacturer's recommendations for application.

E. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
9. Sand lightly between each succeeding enamel or varnish coat.

F. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

G. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

H. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

I. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

J. Mechanical items to be painted include, but are not limited to, the following:
1. Uninsulated metal piping.
2. Uninsulated plastic piping.
3. Pipe hangers and supports.
4. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
5. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.

6. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

K. Electrical items to be painted include, but are not limited to, the following: List below contains electrical items that are usually field painted. Add other items to suit Project.
1. Switchgear.
2. Panelboards.
3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

L. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

M. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

N. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
1. Provide satin finish for final coats.

O. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

P. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Section 220553 and Section 260553 for schedule of color coding of equipment, duct work, piping, and conduit.

B. Paint shop-primed equipment, where indicated.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.

E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 INDOOR AIR QUALITY

A. Wear protective clothing and respirators when applying oil-based paints or using spray equipment with any paints.

B. Maximize ventilation during application and drying.

C. Isolate area of application from rest of building.

D. Vacate space for as long as possible after application. Wait a minimum of 48 hours before occupying freshly painted rooms.

3.06 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.07 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
   1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.08 EXTERIOR PAINT SCHEDULE

A. Concrete Unit Masonry: Provide the following finish systems over exterior concrete unit masonry:
   1. Semigloss Alkyd Urethane Finish: Two finish coats over a block filler
      a. Block Filler: Concrete unit masonry block filler
      b. Finish Coats (Minimum Two): Exterior semigloss alkyd urethane

B. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
   1. Semigloss Alkyd Urethane Finish: Two finish coats over a rust-inhibitive primer
      a. Primer: Exterior ferrous-metal primer
      b. Finish Coats (Minimum Two): Exterior semigloss alkyd urethane

C. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
   1. Semigloss Alkyd Urethane Finish: Two finish coats over a galvanized metal primer
      a. Primer: Exterior galvanized metal primer
      b. Finish Coats (Minimum Two): Exterior semigloss alkyd urethane

3.09 INTERIOR PAINT SCHEDULE

A. Concrete: Provide the following finish systems over interior concrete masonry:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer
      a. Primer: Interior CMU Primer
      b. Finish Coats (Minimum Two): Interior semigloss acrylic enamel

B. Gypsum Board Ceilings & Soffits: Provide the following finish systems over interior gypsum board surfaces:
   1. Flat Acrylic Finish: Two finish coats over a primer
      a. Primer: Interior gypsum board primer
      b. Finish Coats (Minimum Two): Interior flat acrylic paint

C. Gypsum Board (Walls): Provide the following finish systems over interior gypsum board surfaces:
   1. Finish: Two finish coats.
      a. Primer: Interior gypsum board primer
      b. Finish Coats (Minimum Two): Interior Egg Shell Enamel

D. Ferrous Metal: Provide the following finish systems over ferrous metal:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer
      a. Primer: Interior ferrous-metal primer
      b. Finish Coats (Minimum Two): Interior semigloss acrylic enamel

E. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated metal surfaces:
   1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer
      a. Primer: Interior zinc-coated metal primer
      b. Finish Coats (Minimum Two): Interior semigloss acrylic enamel

F. Interior Exposed Metal Decking and Bar Joists:
   1. First and Second Coats: Alkyd flat dry fall
   2. Subsequent coats only as required for complete, proper and full coverage

3.10 WASTE MANAGEMENT

A. Separate waste in accordance with the Waste Management Plan. Set aside extra paint for future color matches, or reuse by Owner. Where local options exist for leftover paint recycling, collect all waste paint by type and provide for delivery to recycling or collection facility.

B. Close and tightly seal all partly used paint and finish containers and store protected in well-ventilated, fire-safe area at moderate temperature.

C. Place empty containers of solvent-based paints in areas designated for hazardous materials.

D. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers for proper disposal.

END OF SECTION

SECTION 101101
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 090050 - Finish Legend.

1.02 SUMMARY

A. This Section includes the following types of visual display boards:
   1. Porcelain enamel markerboards (for liquid chalk)
   2. Vinyl-fabric-faced cork tackboards and tack strips
   3. Mobile Marker Board/ Technology Board

B. Display board installation will utilize “Z” or "L" clip mounting bars top and mounting angles - bottom only. Adhesives used for mounting display boards will not be acceptable.

C. Where visual display boards are too wide for the location indicated, the supplier shall notify the designer and modify the width accordingly.

D. Related Sections: The following sections contain requirements that relate to this section:
   1. Division 6 Section "Miscellaneous Carpentry" for wood blocking and grounds
   2. Division 9 Section 090050 - Finish Legend

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: Include manufacturer's data substantiating that products comply with requirements indicated.

C. Shop Drawings: Provide shop drawings for each type of markerboard, and tackboard required. Include sections of typical trim members and dimensioned elevations. Show anchors, grounds, reinforcement, accessories, layout, and installation details.

D. Samples: Provide the following samples of each product for initial selection of colors, patterns, and textures, as required, and for verification of compliance with requirements indicated.
   1. Samples for initial selection of color and pattern
      a. Porcelain Enamel Markerboard: Manufacturer's color charts consisting of actual sections of porcelain enamel finish showing the full range of colors available for each type of markerboard required
      b. Vinyl-fabric-faced Cork Tackboards: Manufacturer's color charts consisting of actual sections of vinyl fabric, showing the full range of colors, textures, and patterns available for each type of vinyl-fabric-faced cork tackboard indicated

E. Certificates: In lieu of laboratory test reports, when permitted by the Designer/Architect, submit the manufacturer's certification that vinyl-fabric-faced cork tackboard materials furnished comply with requirements specified for flame spread ratings.

1.04 QUALITY ASSURANCE

A. Manufacturer: Furnish all markerboards, tackboards and tackstrips from a single manufacturer for the entire project.

B. Fire Performance Characteristics: Provide vinyl-fabric-faced tackboards with surface burning characteristics indicated below, as determined by testing assembled materials composed of facings and

backings identical to those required in this section, in accordance with ASTM E 84, by a testing organization acceptable to authorities having jurisdiction.

1. Flame Spread: 25 or less
2. Smoke Developed: 10 or less

C. Design Criteria: The drawings indicate sizes, profiles, and dimensional requirements of visual display boards. Other visual display boards having equivalent performance characteristics with deviations from indicated dimensions and profiles may be considered, provided deviations do not change the design concept or intended performance. The burden of proof of equality is on the proposer.

1.05 WARRANTY

A. Porcelain Enamel Markerboard Warranty: Furnish the manufacturer's written warranty, agreeing to replace porcelain enamel markerboards that do not retain their original writing and erasing qualities, become slick and shiny, or exhibit crazing, cracking, or flaking, provided the manufacturer's instructions with regard to handling, installation, protection, and maintenance have been followed.

1. Warranty Period: 50 years

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Visual Display Board Manufacturer: Subject to compliance with requirements, provide products including, but are not limited to one of the following:

1. Porcelain Enamel Markerboards:
   a. American Display Products
   b. American Visual Display
   c. Best-Rite Chalkboard Company
   d. Claridge
   e. Ghent Manufacturing
   f. Lemco Company
   g. Marsh Company
   h. Platinum Visual Systems
   i. Polyvision
   j. Teknion
2. Tackboards and Tackstrips:
   a. American Display Products
   b. American Visual Display
   c. Best-Rite Chalkboard Company
   d. Claridge
   e. Ghent Manufacturing
   f. Marsh Company
   g. Neil, Inc.
   h. Platinum Visual Systems
   i. Polyvision
   j. Weber Costello Company

2.02 MATERIALS

A. Porcelain Enamel Markerboards: Provide balanced, high-pressure-laminated porcelain enamel markerboards of 3-ply construction consisting of face sheet, core material, and backing.

1. Face Sheet: Provide face sheet of 24-gage enameling grade steel especially processed for temperatures used in coating porcelain on steel. Coat the exposed face and exposed edges with a 3-coat process consisting of primer, ground coat, and color cover coat, and the concealed face with a 2-coat process consisting of primer and ground coat. Fuse cover and ground coats to steel at the manufacturer's standard firing temperatures, but not less than 1200 deg F (649 deg C).

2. Markerboard Cover Coat: Provide the manufacturer's standard light-colored special writing surface with gloss finish intended for use with liquid felt-tipped markers.
   a. Color shall be as selected by Designer/ Architect from full range of standard colors.
3. Core: Provide the manufacturer's standard 3/8-inch-thick particleboard core material complying with the requirements of ANSI A208.1, Grade 1-M-1.
4. Backing Sheet: Provide the manufacturer's standard 0.015-inch-thick aluminum sheet backing.
5. Laminating Adhesive: Provide the manufacturer's standard moisture-resistant thermoplastic-type adhesive.

B. Mobile Markerboard: Basis of Design
1. Manufacturer: Teknion
2. Product Type: Routes Tech Board
3. Surface:Tech Board, Whiteboard Laminate Fixed Board WZ
4. Color: TBD - Manufacturer's Standards
5. Product No.: CQCTB
6. Height: 77"
7. Width: 64"

C. Vinyl-Fabric-Faced Tackboards: Provide mildew-resistant, washable, vinyl fabric complying with FS CCC-W-408, Type II, weighing not less than 13 ounces per square yard, laminated to 1/4-inch-thick cork sheet. Provide fabric that has a flame spread rating of 25 or less when tested in accordance with ASTM E 84. Provide color and texture as scheduled or as selected from the manufacturer's standards.
1. Backing: Make panels rigid by factory laminating cork face sheet under pressure to 1/4-inch-thick hardboard backing.

2.03 ACCESSORIES

A. Metal Trim and Accessories: Fabricate frames and trim of not less than 0.062-inch-thick aluminum alloy, size and shape as indicated, to suit type of installation. Provide straight, single-length units wherever possible; keep joints to a minimum. Miter corners to a neat, hairline closure.
1. Where the size of boards or other conditions exist that require support in addition to the normal trim, provide structural supports or modify the trim as indicated or as selected by the Architect from the manufacturer's standard structural support accessories to suit the condition indicated.
2. Tray: Furnish the manufacturer's standard continuous, solid extrusion-type aluminum tray with ribbed section and smoothly curved exposed ends, for each markerboard.
3. Map Rail: Furnish map rail at the top of each unit, complete with the following accessories:
   a. Display Rail: Provide continuous cork display rail approximately 1 or 2 inches wide, as indicated, integral with the map rail.
   b. End Stops: Provide one end stop at each end of the map rail.
   c. Map Hooks: Provide 2 map hooks with flexible metal clips for each 4 feet of map rail or fraction thereof.
   d. Flag Holder: Provide one flag holder for each room.

2.04 FABRICATION

A. Porcelain Enamel Markerboards: Laminate facing sheet and backing sheet to core material under pressure with manufacturer's recommended flexible, waterproof adhesive.

B. Assembly: Provide factory-assembled markerboard and tackboard units, except where field-assembled units are required.
1. Make joints only where total length exceeds maximum manufactured length. Fabricate with the minimum number of joints, balanced around the center of the board, as acceptable to the Designer/Architect.
2. Provide the manufacturer's standard vertical joint system between abutting sections of markerboard.
3. Provide manufacturer's standard mullion trim at joints between markerboard and tackboard.

2.05 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Class II Clear Anodized Finish: AA-M12C22A31 (Mechanical Finish: as fabricated, nonspecular; Chemical Finish: etched, medium matte; Anodic Coating: Class II Architectural, clear film thicker than 0.4 mil).

PART 3 EXECUTION

3.01 PREPARATION

A. Field Measurements: Take field measurements prior to the preparation of shop drawings and fabrication where possible, to ensure proper fitting of the work. Allow for trimming and fitting wherever taking of field measurements before fabrications might delay work.

3.02 INSTALLATION

A. Deliver factory-built markerboard and tackboard units completely assembled in one piece without joints, wherever possible. Where dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to the Designer/Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain surface alignment.

B. Installer must examine the areas and conditions under which units are to be installed and notify the Designer/Architect in writing of conditions detrimental to the proper timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

C. Markerboards and tackboards shall be installed in strict accordance with manufacturer's recommendations, using concealed hangers at the top and wall angle at the bottom. Installation shall not require grounds.

D. Provide blocking pads behind all boards at 16" o.c.

E. Install units in locations and at mounting heights indicated and in accordance with the manufacturer's instructions. Keep perimeter lines straight, plumb and level. Provide all grounds, clips, backing materials, brackets, anchors, trim and accessories necessary for a complete installation.

F. Boards shall not be installed until the walls have been painted. Any damage to the painted walls shall be corrected.

3.03 ADJUST AND CLEAN

A. Verify that accessories required for each unit have been properly installed and that operating units function properly.

B. Clean units in accordance with the manufacturer's instructions.

END OF SECTION

SECTION 101424
SIGNS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 9 Section 090050 - Finish Legend

1.02 SUMMARY

A. This Section includes the furnishing of Specialty Signs. Extent of Specialty Signs is shown on the Drawings and in this section.

B. Forms of Specialty Signs required include the following:
1. Interior Panel signs (mechanical attachment)
2. Cast metal plaques
3. Fabricated letters (exterior)
4. Tactile Exit Signs

C. Work not included in this section:
1. Illuminated exit signs are specified in Division 16.
2. Handicapped parking signs are specified in Division 10 - Exterior Post & Panel Signs.
3. Exterior post and panel signs are specified in Division 10 - Exterior Post and Panel Signs.

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.

C. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
1. Provide message list for each sign required, including large-scale details of wording and layout of lettering.
2. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
3. Furnish full-size rubbings for metal plaques.
4. Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
5. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.
    a. Samples for verification of color, pattern, and texture selected, and compliance with requirements indicated:
        1) Panel Sign Cast Acrylic Sheet and Plastic Laminate: Provide a sample panel not less than 8-1/2 inches by 11 inches for each material indicated. Include a panel for each color, texture, and pattern required. On each panel include a representative sample of the graphic image process required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.
        2) Plastic Dimensional Letters: Provide full-size representative sample of letter type required, showing style, color and material finish and method of attachment.

1.04 QUALITY ASSURANCE

A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.

B. Design Criteria: The drawings indicate size, profiles, and dimensional requirements of signs and are based on the specific type and model indicated. Signs by other manufacturers may be considered provided that deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

C. ADA Regulations: All signage specified herein shall comply with the minimum sign requirements as outlined by the most current Americans with Disabilities Act (ADA).
   1. Manufacturer shall be responsible for complying with all applicable requirements of ADA whether specifically specified or not. Notify Architect of any discrepancies between ADA requirements and the contract documents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
   1. Manufacturers of Interior Panel Signs:
      a. APCO Architectural Sign Systems
      b. ASI Modulex
      c. Best Manufacturing Co.
      d. Contemporary Plastics, Inc.
      e. Fastsigns of Louisville
      f. Innerface Sign System
      g. Inpro
      h. J. Gemini, Inc.
      i. Mohawk Signs
      j. Nelson-Harkins
      k. Serigraphics Sign Systems, Inc.
      l. Signcraft
   2. Manufacturers of Cast Plaques:
      a. American Graphics, Inc.
      b. Andco Industries Corp.
      c. A.R.K. Ramos Manufacturing Company, Inc.
      d. ASI Modulex
      e. Best Manufacturing Co.
      f. Fastsigns of Louisville
      g. Gemini, Inc.
      h. Metal Arts, Division of L & H Manufacturing Co.
      i. Mohawk Signs
      j. Nelson Harkins
      k. Signcraft
      l. The Southwell Company
   3. Manufacturers of Fabricated Letters :
      a. APCO Architectural Sign Systems
      b. ASI Modulex
      c. Best Manufacturing Co.
      d. Contemporary Plastics, Inc.
      e. Fastsigns of Louisville
      f. Innerface Sign System
      g. Inpro
      h. J. Gemini, Inc.
      i. Mohawk Signs

j. Nelson-Harkins
k. Serigraphics Sign Systems, Inc.
l. Signcraft

2.02 MATERIALS

A. Cast Acrylic Sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet, in sizes and thicknesses indicated, with a minimum flexural strength of 16,000 psi when tested in accordance with ASTM D 790, a minimum allowable continuous service temperature of 176 deg F (80 deg C), and of the following general types:
1. Opaque Sheet: Where sheet material is indicated as "opaque," provide colored opaque acrylic sheet in colors and finishes as selected from the manufacturer's standards.
2. Aluminum Extrusions: Provide aluminum extrusions of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
3. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by the aluminum producer and finisher for the casting process used and for the use and finish indicated.
4. ABS Plastic: Provide high-impact thermoplastic composed of copolymers of acrylonitrile, butadiene, and styrene.
5. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to the sign material and mounting surface.
6. Anchors and Inserts: Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.03 PANEL SIGNS

A. Panel Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
1. 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.
2. Material: Plastic
3. Corner Condition: Square corners
4. Panel Thickness: 1/8" minimum
5. Attachments: Mechanical
6. Size: 8" x 8"
7. Copy: Final signage copy shall be provided on the shop drawings; for bidding purposes the bidder shall assume that the room name(s) and their three digit room numbers shall be listed.
8. Where panel signs are indicated to be mounted to window surfaces, the signage fabricator shall provide a matching blank backer panel.

B. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.

C. Raised Copy: Provide sign plaque with raised copy (1/32") and grade 2 braille as an integral part of the plaque. Use photo etching process or reverse engraved process. Other methods to achieve raised and braille will require pre-approval. Sign surface color must be durable and scratch and vandal resistant. Applied copy and braille strips are not acceptable.

D. Room Number and Title: Titles shall be 3/4" Sans Serif Typestyle, centered horizontally and vertically. Numbers shall be 2" Sans Serif Typestyle, centered horizontally and vertically.

E. Changeable Message Inserts: Fabricate signs to allow insertion of 1" x 8" changeable messages in the form of transparent covers with paper inserts printed by Owner.

1. Furnish insert material and software for creating text and symbols for PC-Windows computers for Owner production of paper inserts.

F. Special Symbols: Handicap symbol shall be 3" high. Men/Women symbols shall be 4" high. Locate as directed by Architect.
1. Equivalent raised written description must be placed directly below symbol.

G. See room finish schedule for sign locations and copy. Size shall be nominal 8" x 8" or as indicated. Manufacturer's standard sizes incorporating minor size variations will be accepted.

2.04 CAST METAL PLAQUES

A. Plaques: Castings shall be free from pits, scale, sand holes, or other defects. Comply with requirements specified for metal, border style, background texture, and finish and with requirements shown for thickness, size, shape, and copy. Hand-tool and buff borders and raised copy to produce the manufacturer's standards satin polished finish. Refer to "Finish" article for other finish requirements.
1. Metal: Aluminum
2. Border Style: As selected by Architect/ Designer
3. Background Texture: Manufacturer's standard pebble texture
4. Background Finish: Provide the manufacturer's standard baked enamel finish
5. Layout: Refer to plaque layout on sheet A2.?

2.05 FABRICATED LETTERS (Base of Design: ASI Modulex LF Series)

A. Fabricated Characters: Fabricate letters and numbers to required sizes and styles, using metals and thicknesses indicated. Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories. Comply with requirements indicated for finish, style and size.
1. Aluminum Sheet: Face, not less than 0.090 inch (2.30 mm) thick, .063 returns, .063 welded loose fit backs
2. Thickness: 1"
3. Character Height: Varies; See script and refer to drawings
4. Character Style: Arial
5. Script: FRANKLIN - SIMPSON HIGH SCHOOL (1'-0" High), WEST CAMPUS (1'-2" High)

2.06 FABRICATION - GENERAL

A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.

B. Design, fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-stressing of welds and fasteners.

C. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.

D. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

E. Create signage to required sizes and layout. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.

2.07 FINISHES

A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.

B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
1. Aluminum Finishes: Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

2. Baked Enamel Finish: AA-M4xC12C42R1x (Mechanical Finish: Manufacturer's standard, other nondirectional textured; Chemical Finish: Chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Apply baked enamel in compliance with paint manufacturer's specifications for cleaning, conversion coating, and painting.
3. Organic Coating: Thermosetting modified acrylic enamel primer/topcoat system complying with AAMA 603.8 except with a minimum dry film thickness of 1.5 mils, medium gloss.
4. Color: As selected by the Architect from the manufacturer's standard colors.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

B. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
1. Mounting: Use expansion bolt anchoring device as recommended by manufacturer to attach signs to concrete block walls. Provide minimum 4 fasteners for 8" x 8" signs.
2. Mount interior signs with centerline one foot from latch side of door frames, and top of sign five feet above finish floor. Note: Lower signs as required to meet all ADA requirements.
3. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting location for such signage shall be so that a person may approach within 3 inches (76 mm) of signage without encountering protruding objects or standing within the swing of a door.
4. Where a tactile sign is provided at a door, the sign shall be alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leaves, the sign shall be to the right of the right-handed door. Where there is no wall space on the latch side of a single door, or to the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor area 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
5. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.

C. Dimensional Illuminated Letters:
1. Install product in accordance with supplier's instructions.
2. Install product in locations indicated using mounting methods recommended by sign manufacturer and free from distortion, warp, or defect adversely affecting appearance.
3. Install product level, plumb, and at heights indicated.
4. Install product at heights to conform to Americans with Disabilities Act Accessibility Guidelines (ADAAG) and applicable local amendments and regulations.
5. Install signs within the following tolerances and in accordance with manufacturer's recommendations.
   a. Interior Signs: Within 1/4 inch vertically and horizontally of intended location
   b. Exterior Signs: Within 1 inch vertically and horizontally of intended location

D. Cast Metal Plaques: Mount Plaques using the standard method recommended by the manufacturer for the type of wall surface indicated.

E. Concealed Mounting: Mount plaques by inserting threaded studs into tapped lugs on the back of the plaque. Set in predrilled holes filled with quick-setting cement.

F. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish letter spacing and to locate holes for fasteners. Locate as directed by Architect.
   1. Flush Mounting: Mount letters with backs in contact with the wall surface.

3.02 CLEANING AND PROTECTION

A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

3.03 SIGNAGE SCHEDULE

A. See attached signage schedule.

SECTION 101550
TOILET COMPARTMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 RELATED REQUIREMENTS

A. Section 051200 - Structural Steel Framing: Concealed steel support members

B. Section 055000 - Metal Fabrications: Concealed steel support members

C. Section 061000 - Rough Carpentry: Blocking and supports

D. Section 090050 - Finish Legend

E. Section 102800 - Toilet, Bath, and Laundry Accessories

1.03 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015

B. ASTM E84 - Standard Methods of Testing for Evaluating the Surface Flame Spread and Smoke Developement Characteristics of Building Materials.

1.04 ADMINISTRATIVE MATERIALS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUMMARY

A. This Section includes stock, manufactured toilet compartments.

B. Types of toilet and shower compartments include:
   1. Solid plastic, homogenous color

C. Styles of toilet compartments include:
   1. Floor-anchored, overhead-braced

D. Toilet accessories, such as toilet paper holders, and grab bars are specified in another Division 10 Section.

1.06 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
   1. Product data for materials, fabrication, and installation including catalog cuts of anchors, hardware, fastenings, and accessories
   2. Shop drawings for fabrication and erection of toilet compartment assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work
   3. Samples of full range of colors for each type of unit required: Submit 6-inch-square samples of each color and finish on same substrate to be used in work, for color verification after selections have been made.
   4. Manufacturer's Installation Instructions: Indicate special procedures; perimeter conditions requiring special attention.

1.07 RECYCLED CONTENT

A. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

B. Indicate relative dollar value of recycled content product to total dollar value of product included n project.

C. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.

D. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

1.08 LOCAL/REGIONAL MATERIALS

A. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.

B. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

C. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.

D. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.09 VOC DATA

A. Adhesives: Submit manufacturer's product data for adhesives. Indicate VOC limits of product. Submit MSDS highlighting VOC limits.

B. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

1.10 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of work. However, allow for adjustments where taking of field measurements before fabrication might delay work.

B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet compartments and related items. Coordinate delivery with other work to avoid delay.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

B. Manufacturer: Subject to compliance with requirements, provide products by one of the following including, but are not limited to:

1. Solid Plastic - Polymer Resin - Standard offerings including hammered finishes:
    a. ASI Accurate Partitions
    b. General Partitions
    c. ASI Global Partitions
    d. Metpar Corp.
    e. Scranton Products

2.02 SOLID PLASTIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE).
   1. Color: To be selected from the full line of hammered texture or metallic finishes.

B. Doors:
   1. Thickness: 1 inch
   2. Height: 55 inch
   3. Ship-Lap Gap Concealer on latch side of door
   4. Continuous hinge

C. Panels:
   1. Thickness: 1 inch
   2. Height: 55 inch
   3. Depth: As indicated on drawings

D. Pilasters:
   1. Thickness: 1 inch
   2. Width: As required to fit space; minimum 3 inch

E. Screens: Without doors; to match compartments; mounted to wall with a continuous bracket

2.03 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666, Type 304 stainless steel with No. 4 finish
   1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow

C. Wall and Pilaster (or Pilaster) Brackets: Anodized aluminum

D. Wall Brackets: Continuous type, natural anodized aluminum

E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type
   1. For attaching panels and pilasters to brackets: Through-bolts and nuts, tamper proof

F. Hardware: Satin stainless steel or natural anodized aluminum
   1. Continuous hinge, gravity type, adjustable for door close positioning; two per door
   2. Nylon bearings
   3. Door Latch: Slide type or Thumbturn type
   4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch
   5. Coat hook with rubber bumper; one per compartment, mounted on door
   6. Provide door pull for outswinging doors. Provide pulls on both faces of handicapped compartment doors.

G. Wall Bumper: Provide two aluminum wall bumpers at handicapped toilet door and any other location where standard bumper does not adequately prevent door from striking wall or other accessories. Zamac is not acceptable. Locate bumpers at the top and bottom of the door to prevent the door from flexing and striking the wall or other obstruction.

H. Heat Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid-polymer components to prevent burning.

2.04 FABRICATION

A. General: Furnish standard doors, panels, screens, and pilasters fabricated for compartment system. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

B. Door Dimensions: Unless otherwise indicated, furnish 24-inch-wide in-swinging doors for ordinary toilet stalls and 32-inch-wide (clear opening) out-swinging doors for stalls equipped for use by handicapped.

C. Overhead-Braced Compartments: Furnish galvanized steel supports and leveling bolts at pilasters as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous, extruded, aluminum, antigrip, overhead bracing at top of each pilaster. Provide shoe at each pilaster to conceal supports and leveling mechanism.

D. Wall-Hung Screens: Furnish panel units in sizes indicated, of same construction and finish as partition system panels.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. General: Comply with manufacturer's recommended procedures and installation sequence. Install compartment units rigid, straight, plumb, and level. Secure panels to walls with a continuous aluminum wall bracket. Secure panels to pilasters with a continuous aluminum panel/pilaster bracket to align with wall bracket. Secure panels in position with manufacturer's recommended anchoring devices.

B. Overhead-Braced Compartments: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead brace when doors are in closed position.

C. Screens: Attach with anchoring devices as recommended by manufacturer using a continuous aluminum wall bracket. Set units to provide support and to resist lateral impact.

D. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch

B. Maximum Variation From Plumb: 1/8 inch

3.04 ADJUST AND CLEAN

A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinge on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinge on out-swinging doors (and entrance swing doors) to return to fully closed position.

B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 102123
CUBICLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Curtains (CC1)

1.02 RELATED SECTIONS

A. Section 090050 - Finish Legend

B. Section 095100 - Acoustical Ceilings: Suspended ceiling system to support track

1.03 REFERENCES

A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials

B. NFPA 701 - Standard Methods of Fire Tests for Flame-Resistant Textiles and Films; National Fire Protection Association

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for curtain fabric characteristics and hardware.

C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.

D. Samples: Submit 12 x 12 inch sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Accept curtain materials on site and inspect for damage.

B. Store curtain materials on site and deliver to Owner for installation when requested.

1.06 EXTRA MATERIALS

A. See Section 016000 - Product Requirements, for additional provisions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cubicle Curtains:
1. A. R. Nelson Co; Product ____: www.arnelson.com
2. General Cubicle Co., Inc; Product ____: www.generalcubicle.com
3. Imperial Fastener Co., Inc; Product ____: www.imperialfastener.com
4. Inpro
5. Substitutions: See Section 016000 - Product Requirements

2.02 TRACKS AND TRACK COMPONENTS

A. Track: Extruded aluminum sections; one piece per cubicle track run; I-beam profile.
1. Track Bends: Minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers
2. Escutcheons to Suspension Rods: Aluminum

3. Finish on Exposed Surfaces: Clear anodized finish

B. Curtain Carriers: Nylon slider to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.

2.03 CURTAINS

A. All Curtain Materials:
1. Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E 84

B. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain

C. Curtain Fabrication:
1. Include open mesh cloth at top 18 inches of curtain for room air circulation

D. Curtain Fabric: Momentum Textiles

E. Style: Mood

F. Color: TBD

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.

3.02 INSTALLATION

A. Install curtain track to be secure, rigid, and true to ceiling line.

B. Install end cap and stop device.

C. Install curtains on carriers ensuring smooth operation.

END OF SECTION

SECTION 102601
WALL SURFACE PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Wall Protection Systems:
      a. Corner Guards (CG1)
      b. Semi-Rigid Protective Sheet (WSP1/WSP2)
      c. Vinyl Rub Rail (VR1)

B. Related Sections/Items
   1. Steel angle and bent plate corner guard, refer to Section 05 50 00.
   2. Wood blocking and grounds, refer to Section 06 10 00.

1.02 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product data indicating compliance with specified requirements.

C. Shop drawings showing methods of attachment to substrate and product locations/layout.

D. Samples: For selection of color, pattern, and surface texture.
   1. 12 inch (300 mm) long samples of each type of wall and corner guard required. Include examples of joinery, corners, and field splices.
   2. 7 x 9 inch (175 x 225 mm) samples of each semi-rigid sheet

1.03 QUALITY ASSURANCE

A. Fire Performance Characteristics: Comply with ASTM E 84 for the fire performance characteristics indicated below. Identify components with markings from testing and inspection organization.
   1. Flame Spread: 25 or less.
   2. Smoke Developed: 450 or less.

B. Single Source Responsibility: Obtain wall surface protection system components from a single source.

C. Deliver materials in original factory wrappings and containers, clearly labeled with manufacturer and brand name.

D. Store materials in original undamaged packages and containers inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
   1. Maintain room temperature within the storage area between 60° F (16° C) and 80° F (27° C) during the period plastic materials are stored. Keep materials out of direct sunlight to avoid excessive surface temperatures.
   2. Store rigid plastic corner guard, wall guard, and handrail covers in a horizontal position for a minimum of 72 hours, or until the plastic material attains the ambient room installation temperature of between 65° F (18° C) and 75° F (24° C).

1.04 PROJECT CONDITIONS

A. Maintain ambient temperature within building at not less than 65° F (18° C) or greater than 75° F (24° C) for a minimum 72 hours prior to beginning of installation.

B. Do not install wall surface protection system components until the space is enclosed, weatherproof and climate controlled.

C. Do not install semi-rigid wall protection systems until temperature is stable and permanent lighting is in place.

1.05 MAINTENANCE

A. Maintenance Instructions: Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.

B. Replacement Materials: Minimum 2% of each type, color, and pattern of wall surface protection materials and components. Include accessory components as required. Replacement materials shall be from the same production run as installed materials. Package with protective coverings and appropriate labels.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Basis of design manufacturer: Construction Specialties, Lebanon, NJ. Ph: 800-233-8493; Internet Address: www.c-sgroup.com <http://www.c-sgroup.com>.

B. Drawings and specifications are based on manufacturer's literature from Koroseal Wall Protection Systems unless otherwise indicated.

C. InPro Corporation - shall be considered and approved manufacturer pending compliance with the specifiications.

2.02 MATERIALS

A. Plastic Sheet Wallcovering Material: Textured, chemical-and stain-resistant, high-impact, acrylic modified vinyl plastic sheets, thickness as indicated. Comply with specified requirements of ASTM D 256 for impact resistance and ASTM E 84 for flame spread and smoke developed characteristics.
   1. Texture Pattern: Suede texture

B. Rigid Plastic Material: Extruded, textured, chemical-and stain-resistant, high-impact, acrylic modified vinyl plastic, thickness as indicated. Comply with specified requirements of ASTM D 256 for impact resistance and ASTM E 84 for flame spread and smoke developed characteristics. Color: As selected by Architect from the manufacturer's full range of standard colors.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M) for 6063-T5.

D. Fasteners: Use non-corrosive metal screws, bolts, and other fasteners compatible with aluminum components, hardware, anchors, and other items being fastened. Use theft-proof fasteners where exposed to view.

2.03 CORNER GUARDS

A. Surface-Mounted, Resilient Plastic Corner Guards:
   1. Cover: Rigid, impact-resistant plastic, nominal 0.078 inch (1.9 mm) thick, in dimensions and profiles indicated
   2. Retainer:
      a. Continuous, one-piece, extruded aluminum retainer, nominal 0.062 inch (1.6 mm) thick
   3. SSM-20N: 2 inch (50 mm); Corner Radius: 1/4 inch (6.35 mm)
   4. Color: As selected

2.04 IMPACT-RESISTANT WALLCOVERINGS

A. Semi-rigid, Integrally Colored Sheet Wallcovering: Semi-rigid, embossed, impact-resistant plastic sheet. Comply with fire performance characteristics specified and be chemical-and stain-resistant.
   1. 4000 Series Solid & Wood pattern colors.
      a. Sheet Thickness: 0.040 inch (1.0 mm) thick Class I/A Fire-Rated
      b. Refer to drawings for special size sheet requirements
      c. Color: As selected

B. Accessory Moldings:
   1. Aluminum think trim 1/16"
   2. Color: Satin Anodized Aluminum
      NOTE: All outside corners and exposed edges of protective sheets shall receive an accessory molding unless given prior approval by the Interior Designer.

C. Color Matched Caulk: C100 Color Matched Caulking

D. Adhesive: 3M Fastbond 30NF Contact Adhesive

E. Accessories: Acrovyn Wall Panels shall be furnished as a complete packaged system, including appropriate standard adhesive.

2.05 VINYL RUB RAIL

A. Surface-Mounted, PVC free Rubstrip
   1. Cover: high impact pvc-free acrovyn 4000 suede texture, nominal 0.040" inch (1.02 mm) thick, in dimensions and profiles indicated
   2. Adhesive:
      a. manfucaturer approved adhesive
   3. 4000, RS-40N
   4. Color: As selected

2.06 FABRICATION

A. Comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thicknesses of components.

B. Shop-assemble components to the greatest extent possible. Disassemble only as necessary for shipping and handling.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions in which wall surface protection components and wall protection systems will be installed.

B. Complete finishing operations, including painting, before beginning installation of wall surface protection system materials.

C. Wall surfaces to receive impact-resistant wall covering materials shall be dry and free from dirt, grease, loose paint, and scale.

D. Do not proceed with installations until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Properly prepare substrate and clean to remove dust, debris, and loose particles.

3.03 INSTALLATION

A. Install wall surface protection units plumb, level, and true to line without distortions.

B. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished work.

C. Install aluminum retainers, mounting brackets, and other accessories in strict accordance with the manufacturer's instructions.

D. Where splices occur in horizontal runs of over 20 feet (6 m), splice aluminum retainer and plastic cover at same locations along the run.

3.04 CLEANING

A. Clean plastic covers and accessories using a standard non-ammonia based household cleaning agent.

B. Clean metal components in accordance with the manufacturer's recommendations.

C. Remove excess adhesive in manner recommended by manufacturer.

END OF SECTION

SECTION 102800
TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following toilet accessory items:
1. Grab bars (toilets and showers)
2. Mirrors - stainless steel frame
3. Mop and broom holder (located at each mop sink)
4. Sanitary napkin disposal unit (surface-mounted)
5. Underlavatory guard

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specifications Sections.

B. Product Data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, method of mounting, specified options, and finishes.

C. Setting Drawings: Where cutouts are required in other work, provide templates, substrate preparation instructions, and directions for preparing cutouts and for installation of anchorage devices.

1.04 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices that must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

C. ADA Compliance: Provide products which comply with applicable provisions of the Americans with Disabilities Act.

1.05 PROJECT CONDITIONS

A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

1.06 WARRANTY

A. Special Project Warranty: Provide manufacturer's written 5-year warranty against silver spoilage of mirrors, agreeing to replace any mirrors that develop visible defects within warranty period.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide toilet accessories excluding the electric hand dryer by one of the following including, but not limited to:
1. A & J Washroom Accessories
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation
5. General Accessory Manufacturing Co.

6. Royce Rolls Ringer Co.
7. Columbia Accessories
8. Gamco
9. Searchrome

2.02 MATERIALS, GENERAL

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22-gage (.034-inch) minimum thickness, unless otherwise indicated.

B. Brass: Leaded and unleaded, flat products, ASTM B 19; rods, shapes, forgings, and flat products with finished edges, ASTM B 16, Castings, ASTM B-30.

C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 20-gage (.040-inch) minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 527, G60.

E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

F. Mirror Glass: Nominal 6.0 mm (0.23 inch) thick, conforming to ASTM C 1036, Type I, Class 1, Quality q2, and with silvering, electro-plated copper coating, and protective organic coating.

G. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

I. Keys: Unless otherwise indicated, provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six (6) keys to Owner's representative and obtain receipt.

2.03 GRAB BARS

A. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 gage (.050 inch) and as follows:
   1. Mounting: Concealed, manufacturer's standard anchorages
   2. Clearance: 1-1/2 inches clearance between wall surface and inside face of bar
   3. Gripping Surfaces: Smooth, satin finish
   4. Heavy-Duty Size: Outside diameter of 1-1/2 inches
   5. Anchorage: Grab bar and anchorages shall have capacity to withstand minimum 250 lb. pull in any direction of aluminum duration of 5 minutes.
   6. Product: Bobrick B-6806 or approved equivalent
   7. Refer to drawings for sizes and quantities.

2.04 MISCELLANEOUS ACCESSORIES

A. Mop and Broom Holder: 22-gage (.0299 in) Type 304 stainless steel “hat” channel with spring-loaded rubber cam-type mop/broom holders that grips handles 7/8" to 1-1/4" diameter. Provide 24" long unit with 3 holders.
   1. Product: Bobrick B-223 or approved equivalent

2.05 MIRROR UNITS

A. Stainless Steel Framed Mirror Units: [Type 430 Stainless Steel 1/2" x 1/2" x 3/8" channel with 1/4" return at rear with bright polish finish. Provide locking devices to secure mirror to concealed wall hanger. Utilize concealed philips-head locking screws to securely fasten mirror to wall hanger.]
   1. Size:
      a. 24" w x 36" h
      b. 24" w x 60" h
   2. Product: Bobrick No. B-165 or approved equivalent

2.06 UNDERLAVATORY GUARD

A. Underlavatory Guard: Handicapped sink locations will receive underlavatory guard complying with the following:
   1. Products: Available products include the following:
      a. Insulating Piping Coverings: White, anti-microbial, molded-vinyl covering for supply and drain piping assemblies intended to use at accessible lavatories to prevent direct contact with burns from piping. Provide components as required for applications indicated with flip tops at valves that allow service access without removing coverings.

2.07 FABRICATION

A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item by either a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamper proof glass installation and prevent accumulation of moisture, as follows:
   1. Provide galvanized steel backing sheet, not less than 22 gage (.034 inch) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

E. Mirror Unit Hangers: Provide system of mounting mirror units that will permit rigid, tamper proof, and theft-proof installation, as follows:
   1. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring special tool to remove.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install toilet accessory units in accordance with manufacturers' instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

B. Secure mirrors to walls in concealed, tamper proof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.

3.02 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces in strict accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION

SECTION 104300
EMERGENCY AID SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. First aid cabinets (SA-2)

B. Goggle Cabinets (SA-1)

C. Fire Blanket Cabinet (SA-3)

D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 042000 - Unit Masonry: Roughed-in wall openings.

B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2013a.

B. ICC 500 - Standard for the Design and Construction of Storm Shelters; 2014

1.04 SUBMITTALS

A. Product Data: Provide product content list, color and finish and anchorage details.

B. Maintenance Data: Include test schedules and recertification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. General: Provide safety equipment that complies with requirements specified in this article.
   1. Safety Glasses/Goggles Monitor: Subject to compliance with requirement, provide safety glasses/goggle sanitizer cabinets produced by the following or approved equivalent:
      a. Carolina
         1) Safety Glasses/Goggle Sanitizer No.646846 (SA1)
      b. Companies who products meet or exceed the project specifications as approved by written addendum.
   2. First Aid Kit: Subject to compliance with requirements, provide first aid kits produced by the following or approved equivalent:
      a. First Aid Products Online
         1) First Aid Kit & PPE, 640-500PP
   3. Fire Blanket: Subject to compliance with requirements, provide fire blankets produced by the following or approved equivalent:
      a. Grainger
         1) Sellstrom Fire blanket 5UPX8, S97457 with metal case. Cabinet size, 15" H x 15" W x 2" D.
   4.

2.02 ACCESSORIES

A. Cabinet Door Signage: "First Aid Kit" painted letters or self-adhering decals, prespaced in red lettering.

B. Cabinet Contents: Provide general first aid contents for minimum 50 persons consisting of, but not limited to the following; first aid manual, bandages, wipes, adhesive tape, sterile pads, gloves, aspirin, cold packs, scissors, foil blanket.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level, 48 inches maximum from finished floor to operable opening handle.

3.02 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

3.03 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals for closeout submittals.

END OF SECTION

SECTION 104400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher brackets.

1.02 RELATED REQUIREMENTS

A. Section 042000 - Unit Masonry: Roughed-in wall openings.

1.03 REFERENCE STANDARDS

A. International Building Code; 2015 with Kentucky Amendments; current edition.

B. IFC - International Fire Code; 2012.

C. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

D. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 PERFORMANCE REQUIREMENTS

A. Conform to International Fire code.

B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.05 SUBMITTALS

A. Shop Drawings: Indicate mounting measurements for wall bracket and installation procedures.

B. Product Data: Provide extinguisher operational features.

C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.06 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers, Cabinets, Brackets and Accessories: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the work include:
   1. Basis of Design: concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
      a. Bracket - J. L. Industries; Bracket 10 lb; MB 846.
      b. Fire Extinguisher - J. L. Industries; Cosmic 10E (Class A, B, C).
   2. Products by other manufacturers (listed below) may be considered, provided deviations in dimensions, profiles, and formulations are minor and do not change the design concept as judged by the Architect:
      a. Activar Inc.; JL Industries, Inc: www.activarcpg.com/jl-industries
      b. Larsen's Manufacturing Co: www.larsensmfg.com.

c. Morris Group International/Potter-Roemer: www.potterroemer.com.
d. JL Industries, Inc: www.jlindustries.com.
e. Nystrom, Inc: www.nystrom.com.
f. Kidde, a unit of United Technologies Corp: www.kidde.com.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Dry Chemical Type Fire Extinguishers: Heavy-duty steel tank, with pressure gage.
1. Class A, B, C.Multi-purpose
2. Size: 10 pound.
3. Tank Finish: Corrosion and impact resistant powder coat.
4. Tank Color: Red.
5. Location: All areas of building.
6. Mounting Type: Refer to drawings for cabinet mount or bracket mount symbol.

2.03 BRACKETS AND ACCESSORIES

A. Extinguisher Bracket: Formed steel, powder-coat paint finish.
1. Color: Red

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install brackets so the top of the fire extinguisher is not more than 4 feet above the finished floor.

C. Secure brackets rigidly in place.

D. Place extinguishers on wall brackets.

E. All fire extinguishers to arrive at the job site fully charged.

3.03 SCHEDULES

A. FE-1 Fire extinguisher and bracket.

END OF SECTION 104400

SECTION 105050
METAL LOCKERS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

B. Division 9 Section 090050 - Finish Legend

1.02 SUMMARY

A. This Section includes the following:
   1. Metal Lockers:
      a. New Lockers:Double Tier Lockers (ML1)
         1) Lockers with built-in combination lock or Owner-provided locks and sloping top, knocked-down construction
      b. ADA Single or Double Tier Lockers (ML1*)
         1) Provide ADA compliant lockers with Digilocks.
      c. Steel Shelving (HDS1)

B. Related Sections include the following:
   1. Division 6 Section "Miscellaneous Carpentry" for wood furring and grounds

1.03 SUBMITTALS

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

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
   1. Show sloping tops, locker fillers, trim, base and accessories. Include locker-numbering sequence in student and kitchen staff lockers.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.

D. Samples for Verification: For the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work.
   1. Lockers
   2. Shelving

E. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals specified in Division 1.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain locker units and accessories through one source from a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.

B. Protect lockers from damage during delivery, handling, storage, and installation.

1.06 COORDINATION

A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following including, but not limited to:
   1. Art Metal Products
   2. DeBourgh
   3. List industries
   4. Lyon Metal Products, Inc.
   5. Penco Products, Inc.; Subsidiary of Vesper Corporation
   6. Republic Storage Systems Co., Inc.

B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Metal Locker Schedule at the end of Part 3.

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, matte finish, suitable for exposed applications, and stretcher leveled or roller leveled to stretcher-leveled flatness.

B. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

2.03 WARDROBE LOCKERS

A. Body: Form backs, tops, bottoms, sides, and intermediate partitions from steel sheet; flanged for double thickness at back vertical corners. Comply with the following:
   1. Supply HDC - Heavy-duty Corridor Lockers with 14 gauge doors, 16 gauge top, bottom and shelves and 24 gauge sides and back.

B. Frames: Form channel frames from minimum 0.0598-inch- (1.50-mm-) thick steel sheet; lapped and welded at corners. Form continuous integral door strike on vertical frame members. Provide resilient bumpers to cushion door closing.
   1. Latch Hooks: Form from minimum 0.1046-inch- (2.70-mm-) thick steel; welded or riveted to door frames.
   2. Cross Frames: Form intermediate channel cross frames between tiers from minimum 0.0598-inch- (1.50-mm-) thick steel sheet. Weld to vertical frame members.
   3. Frame Vents: Fabricate vertical face frames with vents.

C. Doors: One-piece steel sheet, formed into channel shape at vertical edges and flanged at right angles at top and bottom edges. Fabricate to prevent springing when opening or closing, and to swing 180 degrees. Comply with the following:
   1. Reinforcement: Brace or reinforce inner face of doors more than 15 inches (381 mm) wide.
   2. Reinforcing and Sound-Dampening Panels: Brace or reinforce inner face of doors with manufacturer's standard reinforcing angles, channels, or stiffener panels.
   3. Acoustical Treatment: Fabricate lockers for quiet operation with manufacturer's standard rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact.
   4. Sound-Dampening Panels: Manufacturer's standard, designed to stiffen door surface and reduce sound levels when door is slammed, of die-formed metal with full perimeter flange and sound-dampening material. Spot weld panel to inside of door.
   5. Louvered Vents: Stamped, louvered vents in door face, as follows:

D. Shelves: Provide hat shelf in single-tier units; fabricated from minimum 16 gauge thick, formed steel sheet; flanged on all edges.

E. Continuous Hinges: Manufacturer's standard, steel continuous hinge mounted to door and frame.

F. Recessed Handle and Latch: Manufacturer's standard housing, formed from 0.0359-inch- (0.90-mm-) thick nickel-plated steel or stainless steel, with integral door pull, recessed for latch lifter and locking devices; nonprotruding latch lifter; and automatic, prelocking, pry-resistant latch, as follows:
   1. Provide minimum three-point latching for each door more than 42 inches (1067 mm) high; minimum two-point latching for each door 42 inches (1067 mm) high or less.
   2. Provide single-point gravity or spring-actuated latch with padlock lug.

2.04 LOCKS

A. Fabricate lockers to receive the following locking devices, installed on lockers using security-type fasteners:
   1. Built-in Combination Locks: Key-controlled, three-number dialing combination locks; capable of at least five combination changes made automatically with a control key. Comply with the following:
      a. Bolt Operation: Manually locking dead bolt or automatically locking spring bolt, as standard with manufacturer.
   2. Owner Provided Combination Locks:
      a. Bolt Operation: Manually locking dead bolt or automatically locking spring bolt, as standard with manufacturer.
   3. ADA compliant lockers shall receive Digilock iButton or approved equivalent.

2.05 LOCKER ACCESSORIES

A. Interior Equipment: Furnish each locker with the following items, unless otherwise indicated:
   1. Hooks: Manufacturer's standard zinc-plated, ball-pointed steel. Provide one double-prong ceiling hook, and not fewer than two single-prong wall hooks. Attach hooks with at least two fasteners.

B. Number Plates: Manufacturer's standard etched, embossed, or stamped, aluminum number plates with numerals at least 3/8 inch (9 mm) high. Number lockers in sequence indicated. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.

C. Recess Trim: Manufacturer's standard; fabricated from minimum 0.0478-inch- (1.20-mm-) thick steel sheet, minimum 2-1/2-inch (64-mm) face width, and finished to match lockers. Fabricate trim in lengths as long as practicable.

D. Filler Panels: Manufacturer's standard; fabricated from minimum 0.0478-inch- (1.20-mm-) thick steel sheet in an unequal leg angle shape, and finished to match lockers. Provide slip joint filler angle formed to receive filler panel.

E. Finished End Panels: Manufacturer's standard; fabricated from minimum 0.0239-inch- (0.60-mm-) thick steel sheet, finished to match lockers, and designed for concealing exposed ends of nonrecessed lockers.

F. Continuously Sloping Tops: Manufacturer’s standard, fabricated from minimum 0.0359 - inch- (.90 mm) thick steel sheet, for installation over lockers with separate flat tops. Fabricate tops in lengths as long as practicable, without visible fasteners at splice locations, finished to match lockers. Provide fasteners, filler plates, supports, and closures, as follows:
   1. Closures: Vertical-end type
   2. Sloped top corner fillers, mitered

2.06 FABRICATION

A. Unit Principle: Fabricate each locker with an individual door and frame, individual top, bottom, back, and shelves, and common intermediate uprights separating compartments.

B. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch.

C. Form locker-body panels, doors, shelves and accessories from one-piece steel sheet, unless otherwise indicated.

2.07 FINISHES, GENERAL

A. Finish all steel surfaces and accessories, except prefinished stainless-steel and chrome-plated surfaces.

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

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

D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.08 STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond. Use manufacturer's standard methods.

B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-enamel finish consisting of a thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1.4 mils (0.036 mm) on doors, frames, and legs, and 1.1 mils (0.028 mm) elsewhere.

C. Powder-Coated Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer finish consisting of a thermosetting powder topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1 mil.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine concrete bases for suitable conditions where metal lockers are to be installed.

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

3.02 INSTALLATION

A. Install metal lockers and accessories level, plumb, rigid, and flush according to manufacturer's written instructions.

B. Assemble knocked-down lockers with standard fasteners, with no exposed fasteners on door faces and face frames.

C. Anchor lockers to floors and walls at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.

D. Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

E. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed lockers.

F. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed lockers.

3.03 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.

B. Clean interior and exposed exterior surfaces and polish stainless-steel and nonferrous-metal surfaces.

C. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit locker use during construction.

D. Touch up marred finishes, or replace locker units that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

3.04 METAL LOCKER SCHEDULE

A. Metal Wardrobe Locker (ML1): Where metal lockers of this designation are indicated, provide products complying with the following:
1. Style: Double Tier
2. Material: Cold-rolled steel sheet
3. Back Material Thickness: 24 gauge
4. Side Material Thickness: 24 gauge
5. Door Material Thickness: 14 gauge
6. Locker Arrangement: Double tier, refer to plans for locations and quantities.
7. Backs: Solid
8. Sides: Solid
9. Door Style: Louvered vents
10. Shelves: Solid
11. Hinges: Side mounted continuous
12. Handles/Latches: Recessed
13. Locks: Built-in combination lock or Owner-provided padlock
14. Color: Selected from manufacturer's standards
15. Size: 12" x 12" x 72" H
16. Base:
17. Provide ADA compliant lockers at all (ML1*) designations.

3.05 STEEL SHELVING SCHEDULE

A. Steel Shelving (HDS1): Where steel shelving of this designation are indicated, provide products complying with the following:
1. Manufacturer: Lyon 8000 Series Shelving 18-guage
2. Material: 18 gauge extra heavy duty, Box “W”
3. Shelves: Provide five adjustable shelves
4. Height: 84" high
5. Width: 36" wide & 48" wide (refer to drawings)
6. Depth: 18"
7. Color: Manufacturer standard colors
8. Shelf Capacity: 750 lbs -1200 lbs

END OF SECTION

SECTION 105723
CLOSET AND UTILITY SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted wire closet shelving.

B. Accessories.

C. Wall mounted steel pegboard & accessories

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Blocking in walls for attachment of shelving.

B. Section 092116 - Gypsum Board Assemblies: Blocking in metal stud walls for attachment of standards.

1.03 REFERENCE STANDARDS

A. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, with installation instructions.

B. Shop Drawings: Provide drawings prepared specifically for this project; show dimensions of shelving and attachment to substrates.

C. Selection Samples: For each color selection required, submit color chips representing manufacturer's full range of available colors and finish.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

C. Store flat to prevent warpage and bending.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wire Storage Shelving:
1. ClosetMaid Corporation : www.closetmaid.com/#sle.
2. RubberMaid Closet and Organization Products : www.rubbermaidcloset.com/#sle.
3. Metro Shelving www.metroshelving.net _____.
4. Global Industrial www.globalindustrial.com_____.
5. Uline www.uline.com_____.
6. Substitutions: See Section 016000 - Product Requirements.

2.02 WIRE STORAGE SHELVING SYSTEMS

A. Applications:

B. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with components and connections required to produce a rigid structure that is free of buckling and warping.

1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
2. Coating: PVC or epoxy, applied after fabrication, covering surfaces.
3. PVC Coating: 9 to 11 mils thick.
4. Epoxy Coating: Nontoxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
5. Standard Mesh Shelves: Cross deck wires spaced at 1 inch.

C. Mounting Hardware for Wire Shelving: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.

2.03 WALL MOUNTED STEEL PEGBOARD

A. Heavy Duty Steel Pegboard; powdercoated, 1/16" depth

B. Size: 36"x19"

C. Accessories to be included: hook set, assorted lock hooks, shelfs and bins.

2.04 SHELVING APPLICATIONS

A. Shelf Depth: 16 inches, unless otherwise indicated.

B. Storage Closets:
1. Wall-to-wall storage shelves, close-mesh cross wire spacing, stacked at 24 inch vertically, not less than 16 inch deep.

2.05 MATERIALS

A. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with all components and connections required to produce a rigid structure that is free of buckling and warping.
1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
2. Coating: PVC or epoxy, applied after fabrication, covering all surfaces.
3. PVC Coating: 9 to 11 mils thick.
4. Epoxy Coating: Non-toxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
5. Standard Mesh Shelves: Cross deck wires spaced at 1 inch.
6. Close-Mesh Shelves: Cross deck wires spaced at 1/2 inch.
7. Corner Units: Same wire spacing as standard mesh shelves; provide wherever shelves meet at right angles.

B. Wall-Mounted Standards: Vertically slotted channel standards with double-tab cantilever brackets to suit shelving; factory finished to match shelving.

C. Mounting Hardware: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.

D. Fasteners: As recommended by manufacturer for mounting substrates.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect areas to receive shelving, to verify that spaces are properly prepared to receive shelf units, and are of dimensions indicated on shop drawings.

B. Verify appropriate fastening hardware.

C. Do not begin installation until substrates have been properly prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, with shelf surfaces level.

B. Cap exposed ends of cut wires.

C. Install back clips, end clips at side walls, and support braces at open ends. Install intermediate support braces as recommended by manufacturer.

3.04 CLEANING

A. Clean soiled surfaces after installation.

3.05 PROTECTION

A. Protect installed work from damage.

B. Touch-up, repair, or replace damaged products before Substantial Completion in a manner that eliminates evidence of replacement.

END OF SECTION

SECTION 106560
WELDING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Welding curtain, track and suspension system

1.02 SUBMITTALS

A. Product data for each component.

B. Shop drawings showing location and extent of welding curtain and strip doors. Include plans, elevations, large-scale details of anchorages, and accessory items. Indicate unit conditions at openings, location and installation requirements for hardware, and direction of travel.

C. Samples for initial selection purposes in the form of manufacturer's color charts showing the full range of colors, textures, and patterns available for each finish indicated.

D. Maintenance data for curtains and strip doors to include in the "Operating and Maintenance Manual" specified in Division 1.
   1. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.

1.03 QUALITY ASSURANCE

A. Source Limitations:
   1. Obtain welding curtains through one source from a single manufacturer.
   2. Obtain strip doors through one source from a single manufacturer.

B. Coordination of Work: Coordinate layout and installation of track and rods with other construction supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system, and partitions.

1.04 DELIVERY, STORAGE AND HANDLING

A. Do not deliver curtains and strip door until building is enclosed, other construction within spaces where screens will be installed is substantially complete, and installation is ready to begin.

1.05 WARRANTY

A. Welding Curtain: Provide manufacturers 5 (five) year warranty on manufacturing defects of curtain material.

B. Curtain Track: Provide manufacturers lifetime warranty on manufacturing defects of track material.

PART 2 PRODUCTS

2.01 WELDING CURTAIN, TRACK, AND SUSPENSION SYSTEM

A. Manufacturers
   1. Welding Curtains: Subject to compliance with requirements, manufacturers offering the following products that may be incorporated into the work include, but are not limited to the following:
      a. Basis of Design: Design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
         1) Akon Curtain and Divider; Industrial Welding Curtain
      b. Products by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect.
         1) Akon Curtain and Divider: www.curtain-and-divider.com

2) AmCraft Manufacturing, Inc.: www.amcraftindustrialcurtainwall.com
3) Goff's Enterprises: www.goffscurtainwall.com

B. Product Requirements:
1. Curtain:
a. Curtain Material: 13 oz vinyl/ fire retardant/ poly reinforced sheet.
1) Refer to C/A2.1 for curtain lengths.
b. Drape: Add 5% of curtain material to width for proper drape.
c. Height: Deduct 3 inch in height of curtain material for track.
d. Vision Panel: Entire curtain to be vision panel type.
e. Color: Blue
f. Grommets: Curtain top to be punched for a grommet every 12 inches.
g. Curtain Sections: Provide velcro to close curtain sections completely.
2. Ceiling Track Assembly:
a. Style: Trolley (curtain to roll from side to side)
b. Construction: Galvanized steel - 16 Gage
1) Components: Refer to C/A2.1 for track lengths and verify all quantities
(a) Straight curtain track
(b) Wall to wall mounted track
(c) Nylon roller curtain hooks
(d) Curtain track end stops
(e) 90 degree corners

PART 3 EXECUTION

3.01 INSTALLATION

A. Install curtains and strips according to manufacturers installation instructions.

3.02 PROTECTION

A. Protect curtains and strips after installation from damage during construction. If damage occurs despite such protection, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION

SECTION 107300
ALUMINUM CANOPY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wall supported manufactured aluminum canopy.
   1. Downspouts will be connected to the storm drainage system.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-In-Place Concrete

B. Section 042000 - Unit Masonry

C. Section 079000 - Joint Sealants

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum.

B. AAMA 2604 - Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

C. AAMA 2605 - Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

D. ASTM B 209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

E. ASTM B 221 - Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire Profiles and Tubes.

1.04 SUBMITTALS

A. Product Data: For the following:
   1. Wall supported canopy, canopy attachment to wall, metal deck, beams, and fascia.
   2. Column supported canopy, columns, column embedment, metal deck, beams and fascia.

B. Shop Drawings: Detail fabrication and installation of all formed metal fabrications. Include dimensioned plans, elevations, sections, and details of components and their connections. Show anchorage and accessory items.
   1. Show downspout attachment to storm drainage system.
   2. Show column/downspout foundation attachment.
   3. Manufacturer to field verify project conditions for wall bracket attachments to ensure proper attachment is indicated in the shop drawings.

C. Field Measurements: Where formed metal canopies are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Design Data: Submit design calculations bearing the seal of a Registered Professional Engineer, licensed in Kentucky. Design calculations shall state that the canopy system design complies with the wind uplift requirements of ASCE 7, the stability criteria of the 2015 IBC with Kentucky Amendments, and all other governing criteria.

E. Selection Samples: Submit color chips representing manufacturer's full range of available colors and patterns. Submit actual samples not photo reproductions.

1.05 KENTUCKY DEPARTMENT OF HOUSING, BUILDINGS AND CONSTRUCTION (HBC) SUBMITTALS

A. In addition to the shop drawings submitted to the Architect for review the pre-engineered metal canopy manufacturer shall also submit shop drawings to the pre-engineered canopy installer for shop drawings submittal to HBC for approval as a requirement of the building permit.

B. Shop Drawings: Each sheet shall be identified with the project name and bear the seal and signature of a Kentucky licensed design professional. Section 107.1 2015 IBC with KY Amendments, current edition.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of canopy system, as specified, with minimum ten years of documented experience.

B. Installer Qualifications: Canopies to be installed by the manufacturer. Third party installation is not acceptable, unless installer is certified through the manufacturer, or installs manufacturers canopies exclusively.

C. Source Limitations: Obtain canopies through one source from a single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver formed metal canopies wrapped in protective coverings and strapped together in suitable packs or in heavy duty cartons. Remove protective coverings before they stain or bond to finished surfaces.

B. Store products on elevated platforms in a dry location.

1.08 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

B. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, gloss reduction, chalking, or flaking.
   1. Provide if manufacturers standard finish is anodized or powder-coated.

C. Provide ten year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
   1. Provide if manufacturers standard finish is painted.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:

B. Basis of Design: design concept and the drawings indicate the size, profiles, dimensional requirements and aesthetics of the following:
   1. Superior Mason Products, LLC.

C. Products by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect.
   1. Architectural Fabrication, Inc.: www.arch-fab.com
   2. Childers Carports and Structures: www.childersonline.com
   3. Mapes Industries:www.mapes.com
   4. MASA Corporation: www.architecturalcanopies.com
   5. Mitchell Metals, LLC: www.mitchellmetals.net
   6. Peachtree Protective Covers: www.peachtreecovers.com

7. Superior Mason Products, LLC - A Four Seasons Building Products Company www.superiormetalproducts.com
8. Tennessee Valley Metals: www.tvmetals.com
9. Rusco Custom Canopies: www.ruscocanopies.com

2.02 MATERIALS

A. General: Provide materials without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

B. Aluminum Members: Extruded aluminum, ASTM B 221, 6063 alloy, T6 temper.

C. Deck Panels: Extruded .062 inch aluminum flush deck
1. Panel Profile: Flat
   a. Deck must be continuously flat across the entire canopy. Deck profile or deck attachment to not create any open spaces to allow bird nesting/roosting.

D. Intermediate Gutters/Drain Beam: Extruded .125 inch aluminum with one end closed at the factory and be provided with top cap that is removable for cleaning.
1. Intermediate Gutter Size: Manufacturers standard size or nominal, 0.188 inch thick, 3 inch wide x 6 inch deep.

E. Fascia/Gutter: Full perimeter extruded .094 inch aluminum fascia/gutter.
1. Fascia Size: Manufacturers standard size or nominal, 0.070 inch thick, 3 inch wide x 7 inch deep to interlock with decking and gutters.

F. Downspouts that are not a supporting column: Fully welded, extruded aluminum tubing, minimum wall thickness of 0.125 inch. Minimum size 3 inch by 3 inch or size as indicated on the drawings.

G. Fasteners: Use fasteners fabricated from same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
1. Provide concealed fasteners for interconnecting formed metal fabrications and for attaching them to other work, unless otherwise indicated.
2. Fasteners to be provided in same finish and color as canopy components.

H. Structural Anchors and Rods: All ferrous fasteners and hanging accessories shall be heavily galvanized or cadmium plated and finished in same finish and color as other canopy components.

I. Flashing: Flashing shall be made of aluminum sheet in same finish and color as the other canopy components. Minimum flashing thickness to be 0.040 inch thick. Coordinate installation of flashing with masonry and/or roofing subcontractor to integrate flashing into throughwall flashing and reglets.

J. Corrosion Control: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

2.03 ACCESSORIES

A. Wire Ball Downspout Strainer: Install wire ball downspout strainer at each downspout location.

2.04 FABRICATION, GENERAL

A. Shop Assembly: Preassemble formed metal canopies in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Coordinate dimensions and attachment methods of formed metal canopies with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned, unless otherwise indicated.

C. Welding: In accordance with ANSI/AWS D1.2.

D. Bent Construction: Factory weld beams to columns with neatly mitered corners to form one piece rigid bents. Make welds smooth and uniform using an inert gas shielded arc. perform suitable edge preparation to assure 100% penetration. Grind welds only where interfering with adjacent structure to allow for flush connection. Field welding is not permitted.

E. Deck Construction: Fabricate from extruded modules that interlock in a self-flashing manner. fasten interlocking joints at on center spacing creating a monolithic structural unit capable of developing the full strength of the sections. Fastening to have minimum shear strength of 350 pounds each. Assemble deck with sufficient camber to offset dead load deflection.

F. Form metal to profiles indicated, in maximum lengths to minimize joints. Produce flat, flush surfaces without cracking or grain separation at bends. Fold back exposed edges of unsupported sheet metal to form a 1/2 inch (12 mm) wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch (1 mm) and support with concealed stiffeners.

G. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed metal units as needed to attach and support other construction.

H. Provide support framing, mounting and attachment clips, splice sleeves, fasteners, and accessories needed to install formed metal fabrications.

2.05 FINISHES, GENERAL

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

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

C. Apply organic and anodic finishes to formed metal after fabrication, unless otherwise indicated.

2.06 ALUMINUM FINISHES

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

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

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

D. Canopy finishes: Due to differences in canopy manufacturer finishing standards provisions for clear and/or color anodized, painted and powder coated material is included. All finishes are acceptable and manufacturers are to provide their standard of ONE listed below.

1. High-Performance Organic Finish (2-coat Fluoropolymer): AA-C12C40R1X (Chemical Finish): cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
    a. Color to be selected from manufacturers standard color chart. Minimum twenty colors.
    b. All canopy components to be painted; fascia, deck, wall hangers, accessories, and drain beam.
    c. Extruded deck to be painted the same color on the topside and underside.

2. Powder Coated Finish: AAMA 2604 thermosetting resin of, 1.20 mils minimum, modified polyesters electrostatically applied to the aluminum profile. Profile to be baked in an oven where the powder particles are melted to a liquid state, fusing together to form a homogenous film.
   a. Color to be selected from manufacturers standard color chart. Minimum sixteen colors.
   b. All canopy components to be painted; fascia, deck, wall hangers, accessories, and drain beam.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Locate and place formed metal fabrications level, plumb, and in alignment with adjacent construction.

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

C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers as indicated.

D. Corrosion Protection: Coat concealed surfaces of aluminum, zinc coated, and nonferrous metals that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

E. Entire unit shall be erected straight and true.

F. Hanger rods shall be anchored using through bolt type anchors to support dead and live loads, as recommended by the manufacturer.

3.02 ADJUSTING

A. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

3.03 PROTECTION

A. Protect finishes of formed metal canopies from damage during construction period. Remove temporary protective coverings at time of Substantial Completion.

END OF SECTION 107300

SECTION 114000
FOODSERVICE EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stainless Steel Cabinets (STST1- STST3)

B. Stainless Steel Worktables (STST4)

C. Stainless Steel Pot & Pan Rack (STST5)

D. Mobile Wire Shelving Units (MSS1)

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Sealing joints between equipment and adjacent walls, floors, and ceilings.

B. Section 114001 - Custom Fabricated Foodservice Equipment.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

C. ITS (DIR) - Directory of Listed Products; current edition.

D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

E. NSF 2 - Food Equipment; 2014.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on appliances; indicate configuration, sizes, materials, finishes, locations, and utility service connection locations, service characteristics, and wiring diagrams.

C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

D. Certificates: Certify that products of this section meet or exceed specified requirements.

E. Operation Data: Provide operating data for the specified equipment.

F. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of standard products of the type specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products clear of floor in a manner to prevent damage.

B. Coordinate size of access and route to place of installation.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal casework that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
   1. Delamination of components or other failures of glue bond
   2. Warping of components
   3. Failure of operating hardware
   4. Deterioration of finishes

PART 2 PRODUCTS

2.01 STAINLESS STEEL CASEWORK

A. General: Basis of Design - Advance Tabco. Provide all 304 stainless steel 18 gauge **(STST1-STST3)**

B. Features:
   1. Top 14 gauge stainless steel type 304
   2. Body 18 gauge stainless steel type 430
   3. Stainless Steel 1 1/2" adjustable hex foot
   4. Stainless steel sliding doors
   5. Flat top countertop @ island locations : CB-SS-305M
      a. 1 5/8" sanitary rolled rim on the front side and 1 5/8" square bend edged on the two sides and rear
   6. 5" backsplash top @ areas against wall : CK-SS305M
      a. 1 5/8" sanitary rolled rim on the front side and 1 5/8" square bend edged on the two sides and 5" splash with a 1" return on the rear side
   7. Top is mechanically polished to a satin fiish and sound deadend.
   8. Hat section secured to top reinforces and maintains level work surface

C. Standard Dimensions:
   1. Cabinet:
      a. 35 1/2" High (1 1/2" adjustable).
      b. 30" Deep, including door (3/4" thick).
      c. 60" - 96" wide (refer to drawings for locations and sizes)

2.02 STAINLESS STEEL WORK TABLES

A. General: Basis of Design - Advance Tabco. Provide all 304 stainless steel 18 gauge **(STST4)**

B. Features:
   1. Top 16 gauge stainless steel type 304
   2. Adjustable shelf 18 gauge stainless steel type 430, with stainless steel gussets
   3. Stainless Steel 1 1/2" adjustable hex foot
   4. 1 5/8" diameter tublar stainless steel. 1" stainless steel legs & bullet feet
   5. Flat top countertop: MSLAG-306-X
      a. 1 5/8" sanitary rolled rim on the front, rear and square sides. and 1 5/8" square bend edged on the two sides
   6. Top is mechanically polished to a satin fiish and sound deadend.
   7. Hat section secured to top reinforces and maintains level work surface

C. Standard Dimensions:
   1. Cabinet:
      a. 35 1/2" High (1 1/2" adjustable).
      b. 30" Deep, including door (3/4" thick).
      c. 72" wide (refer to drawings for locations)

2.03 STAINLESS STEEL POT RACK COMPONENT

A. General: Basis of Design - Advance Tabco. Provide all 304 stainless steel 18 gauge **(STST5)**

B. Features:
1. Top 16 gauge stainless steel type 304
2.
3. Stainless Steel 1 5/8" adjustable uprights
4. Plated pot hooks AUR-72, 9 hooks
5. Adjustable pot rack SWT-72, 18 hooks
6. 1 5/8" sanitary rolled rim on the front, rear and square ends.s
7. Adjustable shelves w/ 1" splash on rear edge
   a. PT-12R-72 12" shelf
8. Rear- mount design TA-229

2.04 MANUFACTURERS

A. Food Service Equipment:
1. Advanco Tabco; ____: www.advancetabco.com
2. Metro Shelving: www.metroshelving.com
3. John Boos; ____: www.johnboos.com
4. Eagle Group;_____. www.eaglegrp.com
5. Substitutions: See Section 016000 - Product Requirements.

2.05 EQUIPMENT

A. Equipment Schedule: Refer to schedule at end of this section.

B. Installation Accessories: Provide all rough-in hardware, supports and connections, attachment devices, closure trim, and accessories required for complete installation.

2.06 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

B. Stainless Steel Sheet: ASTM A666 Type 304 commercial grade, No. 4 finish.

C. Finish Hardware: Manufacturer's standard.

2.07 FABRICATION

A. Install rubber button feet on bearing surface of any item positioned on a finished surface.

B. Accommodate site installation of other services or equipment.

2.08 FINISHES

A. All Components: Shop finish.

B. Stainless Steel: No. 4 finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify ventilation outlets, service connections, and supports are correct and in required location.

B. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install items in accordance with manufacturers' instructions.

B. Insulate to prevent electrolysis between dissimilar metals.

C. Use anchoring devices appropriate for equipment and expected usage.

3.03 EXISTING EQUIPMENT

A. Obtain, move, store, and re-install equipment, ready for utility connection.

B. Do work in cooperation with Owner so that normal function of services is minimally interrupted.

C. Re-used Equipment: Refer to schedule on drawings for re-used equipment.

3.04 ADJUSTING

A. Adjust equipment and apparatus to ensure proper working order and conditions.

B. Remove and replace equipment creating excessive noise or vibration.

3.05 CLEANING

A. Remove masking or protective covering from stainless steel and other finished surfaces.

B. Wash and clean equipment.

C. Polish glass, plastic, hardware, accessories, fixtures, and fittings.

3.06 PROTECTION

A. Remove protective coverings from prefinished work.

B. Protect finished work from damage.

END OF SECTION

SECTION 122413
MANUALLY OPERATED WINDOW SHADES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Section includes: Manually operated, roll-up fabric window shades including mounting and operating hardware.
   1. Shade types:
      a. Typical roller shades at exterior windows, 3% openness, and noted interior window locations (RWS1)
      b. Opaque roller shades at Interior Corridor Windows and Door Lites (RWS2)
      c. Roller Door Shades - Black out Window Shade – Equal to BlackoutEZ.com, Black vinyl roller shade with ties, located on drawings (BWS1)
   2.

1.02 RELATED REQUIREMENTS

A. Division 1 Specifications Sections for Submittal Procedures.

B. Section 079005 - Joint Sealers: Acoustic sealant/sound caulk.

C. Section 090050 - Finish Legend.

D. Section 092116 - Gypsum Board Assemblies: Suspended gypsum board ceiling recessed window shade pockets.

E. Section 095113 - Acoustical Panel Ceilings: Suspended acoustical panel ceilings to contain recessed window shade pockets.

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement (replaced SG-971)

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009

I. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition

1.04 SUBMITTALS

A. Submit in accordance with Division 1 Specifications Sections for Submittal Procedures:
   1. List of proposed products and product data
   2. Shop drawings showing window openings, dimensions, and attachment method
   3. Samples for selection by Interior Designer:

a. Fabrics: Sheerweave SW 2400-3% openness and opaque fabrics.

4. Window Shade Schedule listing rooms, field verified window dimensions, quantities, type of shade, fabric, and color
5. Manufacturer's installation and maintenance instructions

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. NFPA Flame-Test: Passed NFPA 701. Materials tested shall be identical to products proposed for use.

C. Store products in manufacturer's unopened packaging until ready for installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.

B. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.

C. Label containers and shades according to Window Shade Schedule.

1.07 PROJECT CONDITIONS

A. Install roller shades after finish work and ambient temperature, humidity, and ventilation conditions are maintained at levels recommended for project upon completion.

B. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruptions of constuction progress.

C. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.08 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.09 WARRANTY

A. Provide under provisions of Division 1 Specifications Sections for Contract Closeout: 5 years warranty against defects in materials and workmanship for clutch operating mechanism.

PARTS 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Draper, Inc., 411 South Pearl Street, Spiceland, Indiana 47385-0425; 765-987-7999

B. Springs Window Fashions Division, Inc.

C. Hunter Douglas Window Fashions

D. Lutron

E. Blackout EZ

F. Manufacturers of equivalent products submitted and approved in accordance with Section 01630 - Product Substitution Procedures.

2.02 MANUALLY OPERATED WINDOW SHADES

A. Type: Manually operated, vertical roll-up, fabric window shade with bead chain and clutch operating mechanism, mounting brackets, fasteners, and other components necessary for complete installation; Equal to FlexShade as manufactured by Draper, Inc.

B. Method of installation: Mounted inside of window opening and extending from head to sill and jamb to jamb.

C. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide preset limit stops to prevent shade from being raised or lowered too far.
1. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon
2. Control loop: Stainless steel bead chain hanging at side of window
3. Chain location: Right hand side when facing window from interior
4. Bead Chain Hold Down: Spring-Loaded Tensioner complying with ANSI/WCMA A100.1-2022 safety standards

2.03 WINDOW SHADE TYPES

A. Manual Window Shades-Roller Window Shades Typical (RWS1)
1. Manufacturer: Draper
2. Shade Fabric: Sheerweave SW2400
3. Openness Factor: 3%
4. Color: Manufacturer's standard
5. Fascia: Clear Anodized
6. Location: Exterior Windows except at corridors, stairs and vestibules, noted exterior windows and noted interior windows.

B. Manual Window Shades-Roller Window Shades -Opaque-Science (RWS2)
1. Manufacturer: Draper
2. Shade Fabric: Light Blocking
3. Color: Opaque
4. Fascia: Clear Anodized
5. Location: Interior Corridor Windows including Door Lites

C. Manual Roller Door Shades - Black out Window Shades (BWS1)
1. Manufacturer: BlackoutEZ.com
2. Type: Black Out Vinyl Roller Shade with Ties
3. Color: Black
4. Size: Refer to Drawings
5. Locations: Refer to Drawings

2.04 HARDWARE

A. Mounting Brackets: 1018 plated steel stamping. Sizes 1 5/8” and 2 ¼”. Mount to face, ceiling or jamb. Brackets do not require additional adapters.

B. Fascia: L-shaped cover of extruded aluminum, .060 wall. Snap-lock assembly to end caps without exposed fasteners. Anodized Aluminum (standard) finish or black, white, ivory or bronze powder coat finish.

2.05 FABRIC

A. Material: Manufacturer's standard 3% open light filtering fabric equal to SheerWeave 2400 and opaque fabrics.

PART 3 - EXECUTION

3.01 PREPARATION

A. Field verify window dimensions prior to fabrication.

B. Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.

3.02 INSTALLATION

A. Install window shades at locations indicated on drawings and approved Window Shade Schedule.

B. Comply with shade manufacturer's written instructions and approved shop drawings.

C. Install roller shades level, plumb, square, and true. Allow proper clearances for window operation hardware.

D. Install the following items to conceal roller and operating mechanism. Do not use exposed fasteners.
1. Fascias
2. Closure panels
3. Endcaps

E. Position shades level, plumb, and at proper height relative to adjacent construction. Secure with fasteners recommended by manufacturer.

3.03 ADJUSTING AND CLEANING

A. Operate shade through complete cycle of lowering, stopping, and raising to ensure proper operation. Adjust as required for smooth operation.

B. Clean shade assemblies and protect from damage from construction operations. If damage occurs, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION

SECTION 123550
INSTITUTIONAL CASEWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This Section includes the following:
   1. Plastic laminate faced wood cabinets of stock design (HPL7)
   2. Plastic laminate countertops (HPL6)

B. In some instances specific manufacturer's model numbers have been used to more clearly define the casework design and are not provided to preclude other acceptable manufacturer's from supplying equal products.

C. Related Sections include the following: List below only products and construction that the reader might expect to find in this Section but are specified elsewhere.
   1. Division 6 Section "Miscellaneous Carpentry" for wood blocking for anchoring institutional casework
   2. Division 6 Section "Interior Architectural Woodwork" (Custom Millwork)
   3. Division 9 Section "Gypsum Drywall" for reinforcements in gypsum board partitions for anchoring institutional casework
   4. Division 9 Section "Resilient Wall Base and Accessories" for resilient base applied to institutional casework

1.02 RELATED REQUIREMENTS

A. Section 013510 - LEED Green Building Summary, Requirements and Goals

B. Section 090050 - Finish Legend

1.03 DEFINITIONS

A. Exposed Portions of Cabinets: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches (1220 mm) above floor, and surfaces visible in open cabinets. The bottom of wall cabinets are considered exposed and will receive plastic laminate.

B. Concealed Portions of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, and ends and backs that are placed directly against walls or other cabinets.

1.04 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement (replaced SG-971)

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013

C. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009

I. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition

1.05 SUBMITTALS

A. Product Data: For each type of product indicated

B. Shop Drawings: Show fabrication and installation details for institutional casework. Include plans, elevations, sections, details, and attachments to other Work.

C. Samples for Initial Selection: For cabinet finishes and for each type of top material indicated

D. Samples for Verification: 6-inch- (150-mm-) square Samples for each type of finish, including top material and the following:
1. Section of countertop showing top, front edge, and backsplash construction

1.06 RECYCLED CONTENT

A. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

B. Indicate relative dollar value of recycled content product to total dollar value of product included in project.

C. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.

D. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

1.07 LOCAL/REGIONAL MATERIALS

A. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.

B. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.

C. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.

D. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.08 VOC DATA

A. Adhesives:
1. Submit manufacturer's product data for adhesives used on site. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
2. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this section.

1.09 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative of institutional casework manufacturer for installation and maintenance of units required for this Project.

B. Source Limitations: Obtain institutional casework through one source from a single manufacturer.

C. Quality Standard: Build and install to AWI quality standards.

D. Product Designations: Drawings indicate sizes, configurations, and finish material of institutional casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework

of similar sizes and door and drawer configurations, of same finish material, and complying with the Specifications may be considered. Refer to Division 1 Section "Product Requirements."

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver institutional casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified in "Project Conditions" Article.

B. Keep finished surfaces covered with polyethylene film or other protective covering during handling and installation.

1.11 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install institutional casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify all dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating institutional casework without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.12 COORDINATION

A. Coordinate layout and installation of metal framing and reinforcements in gypsum board assemblies for support of institutional casework.

1.13 SEQUENCING AND SCHEDULING

A. Coordinate the work with all sections referencing this section.

1.14 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of institutional casework that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
   1. Delamination of components or other failures of glue bond
   2. Warping of components
   3. Failure of operating hardware
   4. Deterioration of finishes
   5. Warranty Period: Five years from date of substantial completion

1.15 EXTRA MATERIALS

A. Furnish complete touchup kit for each type and finish of institutional casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged casework finish.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

B. Basis-of-Design Product: The design for institutional casework is based on TMI Systems Design Corp. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

C. Plastic Laminate Faced Institutional Casework:
1. Action Outfitters
2. Advanced Cabinet Systems
3. Advantage Millwork
4. America's Finest Woodworking Team
5. Architectural Cabinet Systems; Division of Windham Millwork, Inc.
6. Case Systems, Inc.
7. Caseworks of Kentucky
8. Creative Cabinets
9. Cumberland Manufacturing
10. Custom Casework
11. Custom Creations
12. Diversified Woodworking
13. Euronique, Inc.
14. Fisher Hamilton Inc.
15. Hamilton Sorter
16. Hausmann Industries, Inc.
17. Interior Wood Specialties, Inc.
18. Kentucky Mill & Casework
19. Leininger Cabinets
20. Louisville Lumber
21. LSI Corporation of America, Inc.
22. Morgan Smith Industries
23. Norlab, Inc.
24. Polyvision Corporation
25. Procase Countertops
26. Riverside Mill
27. Smith’s Laminating
28. Southern Cabinetry, Inc.
29. Stevens Industries, Inc.
30. Tate Ornamental
31. Techline
32. Terrill Manufacturing Company
33. TMI Systems Design Corp.
34. Top Service
35. U.S. Millwork
36. Wenger Co.
37. Westmark Commercial Casework

D. Plastic Laminate Material:
1. Arborite
2. Formica Corporation
3. Nevamar
4. Wilsonart International; Div. of Premark International, Inc.

E. Rigid PVC Extrusions (3mm & 1mm):
1. Wood Tape

2.02 MATERIALS

A. General:
1. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood
2. Hardwood Plywood: HPVA HP-1, either veneer core or particle core, unless otherwise indicated
3. Softwood Plywood: DOC PS 1

4. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue
5. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue
6. Hardboard: AHA A135.4, Class 1 Tempered
7. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3
8. Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3 mm thick at doors and drawer fronts, 1 mm thick elsewhere

B. Exposed Cabinet Materials:
1. Plastic Laminate: Type VGS.
a. Unless otherwise indicated, provide plastic laminate for exposed surfaces.
b. Provide plastic laminate for doors and drawer fronts and where indicated.

C. Semiexposed Cabinet Materials:
1. Plastic Laminate: Type CLS
a. Provide plastic laminate for interior faces of doors and drawer fronts [only/and] where indicated.
2. Melamine-Faced Particleboard: Particleboard with decorative surface of thermally fused, melamine-impregnated web and complying with LMA SAT-1
a. Provide melamine-faced particleboard for semiexposed surfaces, unless otherwise indicated.
3. Cabinets with glass doors: provide plastic laminate to match the exterior of the cabinet unless shown otherwise on the drawings.

D. Concealed Cabinet Materials:
1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semiexposed faces shall be same species as faces.
3. Plastic Laminate: Type BKL

2.03 DESIGN, COLOR, AND FINISH

A. Design: Provide institutional casework of the following design:
1. Flush overlay with wire pulls

B. Melamine-Faced Particleboard Colors, Patterns, and Finishes: As selected by Architect from casework manufacturer's full range.

C. Plastic-Laminate Colors, Patterns, and Finishes: As selected by Architect from plastic-laminate manufacturer's full range.

D. Rigid PVC Extrusions (3mm & 1mm). As selected by Architect/Designer from PVC edging manufacture selections - provide a minimum of 65 color/pattern selection(s).

2.04 CABINET FABRICATION

A. Plastic-Laminate-Faced Cabinet Construction:
1. Bottoms and Ends of Cabinets, Shelves, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch (19-mm) particleboard, plastic-laminate faced on exposed surfaces, melamine faced on semiexposed surfaces. The bottom of wall cabinets is considered exposed and will receive plastic laminate. The front exposed edges of the cabinet shall receive plastic laminate.
2. Backs of Cabinets: 1/2-inch (12.7-mm) particleboard, plastic-laminate faced on exposed surfaces, melamine faced on semiexposed surfaces.
3. Drawer Fronts: 3/4-inch (19-mm) particleboard, plastic-laminate faced on both sides.
4. Drawer Sides and Backs: 1/2-inch (12.7-mm) solid wood or plywood or particle board, with glued dovetail or multiple-dowel joints.
5. Drawer Bottoms: 1/4-inch (6.4-mm) plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch (12.7-mm) material for drawers more than 24 inches (600 mm) wide.
6. Doors: 3/4-inch (19-mm) particleboard or medium-density fiberboard, plastic-laminate faced on both sides.

B. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

C. Sloped tops: Provide sloped laminate tops where indicated on plans and elevations; all exposed side to receive high pressure laminate; fabricated from same material and with same finish as cabinets.

D. All wall and base cabinets over 3'-0" in width shall receive a vertical to prevent deflection.

2.05 CASEWORK HARDWARE

A. Hardware, General: Provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated.
1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. 5-Knuckle Hinges: Chrome-plated or Powder-coated, semi-concealed, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 hinges for doors less than 48 inches (1220 mm) high and 3 hinges for doors more than 48 inches (1220 mm) high.

C. Pulls: Pulls as standard shall be surface mounted solid aluminum. Provide 2 pulls for drawers more than 24 inches (600 mm) wide. Wire pulls shall be 4" wide.

D. Door Catches: Powder-coated, nylon-roller spring catch. Provide 2 catches on doors more than 48 inches (1220 mm) high.

E. Drawer Slides: Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings. Type B05091, and rated for the following loads:
1. Box Drawer Slides: 100 lbf (440 N)
2. File Drawer Slides: 150 lbf (670 N)
3. Pencil Drawer Slides: 45 lbf (200 N)
4. Keyboard Slide: 75 lbf (330 N)

F. Drawer and Cupboard Locks: Cylindrical (cam) type, 5-pin tumbler, brass with chrome-plated finish, complying with BHMA A156.11, Grade 1.
1. Provide a minimum of two keys per lock and six master keys.
2. Provide locks where indicated.

G. Grommets for Cable Passage Through Countertops: 3 ½" OD, Molded-plastic grommets and matching caps with slot for wire passage. Color to be selected by designer.

H. Adjustable Shelf Supports: 2-pin locking plastic shelf rests complying with BHMA A156.9, Type B04013

I. Countertop / Shelf Support: Provide countertop/shelf supports equivalent to A & M Hardware, Inc., workstation brackets, size brackets to suit installation.

J. File Drawer Frame System: Provide a metal file frame system in all file drawers equal to Rockler Woodworking & Hardware # 30976 with cut-to-size side rails, front & back rails, and side-to-side rail.

2.06 COUNTERTOPS

A. Countertops, General: Provide smooth, clean exposed tops and edges in uniform plane free of defects. Provide front and end overhang of 1 inch (25 mm) over base cabinets.

Note: Countertops for 3 mm edge banding & radius corners.

B. Plastic-Laminate Tops: Plastic-laminate sheet, shop bonded with waterproof glue to both sides of 1" to 1-1/4" (29-mm) plywood or particleboard. Sand surfaces to which plastic laminate is to be bonded. Plastic laminate below is standard general-purpose grade.
1. Plastic-Laminate Type for Flat Tops: HGS
2. Plastic-Laminate Type for Backing: BKL

3. Provide PVC edgings on front edge of top, and on ends of tops.
4. Use exterior plywood or phenolic-resin-bonded particleboard for countertops containing sinks.

C. Provide grommets at all KS locations per owner's direction.

PART 3 - EXECUTION

3.01 EXAMINATION

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

3.02 CASEWORK INSTALLATION

A. Install plumb, level, and true; shim as required, using concealed shims. Where institutional casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to partition framing, wood blocking, or reinforcements in partitions with fasteners spaced 24 inches (600 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).
1. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with fasteners spaced 24 inches (600 mm) o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than two fasteners.

C. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
1. Fasten through back, near top and bottom, at ends, and not more than 16 inches (400 mm) o.c.

D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises, unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

E. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.03 INSTALLATION OF TOPS

A. Field Jointing: Where possible make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

B. Secure tops to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each front, end, and back.

C. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.

D. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and walls with adhesive.

E. Seal junctures of top, splash, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.04 INSTALLATION OF SHELVING

A. Securely fasten adjustable shelving supports to partition framing, wood blocking, or reinforcements in partitions.

B. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

3.05 CLEANING AND PROTECTING

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

C. Protection: Provide 6-mil (0.15-mm) plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches (1220 mm) o.c. Remove protection at Substantial Completion.

END OF SECTION

SECTION 210000 – GENERAL PROVISIONS FOR FIRE SUPPRESSION

Reference Section 230000 – General Provisions for Mechanical

END OF SECTION 210000

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

Reference Section 230500 – Common Work Results for Mechanical

END OF SECTION 210500

SECTION 211000 – WATER-BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves and equipment.
3. Sprinkler specialty pipe fittings.
4. Sprinklers.
5. Alarm devices.
6. Pressure gages.

B. All work in this Section shall be performed by a Licensed/Certified Sprinkler Contractor recognized by the state.

C. The contractor shall furnish and pay all costs associated with permits, licensing, drawing reviews, installation inspections, and etc. as required by state and/or local authorities.

1.2 SYSTEM DESCRIPTIONS

A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.3 PERFORMANCE REQUIREMENTS

A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.

B. Delegated Design: Design sprinkler and standpipe systems, including comprehensive design analysis by a Licensed/Certified Sprinkler Contractor recognized by the state.

C. Sprinkler and standpipe systems design shall be approved by authorities having jurisdiction.

1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water distribution piping, valves, and backflow preventers.

2. Sprinkler Occupancy Hazard Classifications:

   a. As specified on drawings.

3. Minimum Density for Automatic-Sprinkler Piping Design:

   a. According to NFPA recommendations.

4. Maximum Protection Area per Sprinkler:

a. Per UL listing.

5. Total Combined Hose-Stream Demand Requirement:

a. According to NFPA recommendations.

D. Seismic Performance: Sprinkler and standpipe piping shall withstand the effects of earthquake motions determined according to NFPA 13 and ASCE/SEI 7.

1.4 SUBMITTALS

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

B. Shop Drawings: For sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the Licensed/Certified Sprinkler Contractor recognized by the state responsible for their preparation.

D. Qualification Data: For qualified Designer/Installer.

E. Approved Sprinkler and Standpipe Systems Drawings: Working plans, prepared according to NFPA 13 and NFPA 24 that have been approved by authorities having jurisdiction, including hydraulic calculations.

F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13 and NFPA 24. Include "Contractor's Material and Test Certificates."

G. Field quality-control reports.

H. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional design services needed to assume design responsibility. Base calculations on results of fire-hydrant flow test (to be performed by Installer).

a. Design Responsibility: Preparation of working plans, calculations, and field test reports by a Licensed/Certified Sprinkler Contractor recognized by the state.

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.

C. NFPA Standards: Sprinkler systems equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Standard for the Installation of Sprinkler Systems."
2. NFPA 24 “Standard for the Installation of Private Fire Service Mains and Their Appurtenances.”

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.2 STEEL PIPE AND FITTINGS

A. Schedule 40, Black-Steel Pipe: ASTM A 135; ASTM A 795. Pipe ends may be factory or field formed to match joining method.

B. Schedule 10, Black-Steel Pipe: ASTM A 135; ASTM A 795. Pipe ends may be factory or field formed to match joining method.

C. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53, standard-weight, seamless steel pipe with threaded ends.

D. Uncoated, Steel Couplings: ASTM A 865, threaded.

E. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

F. Malleable- or Ductile-Iron Unions: UL 860.

G. Cast-Iron Flanges: ASME B16.1, Class 125.

H. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.

I. Grooved-Joint, Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Anvil International, Inc.
    b. Tyco Fire & Building Products LP.
    c. Victaulic Company.
    d. Approved equal.

2. Pressure Rating: 175 psig minimum.
3. Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
4. Galvanized, Grooved-End Fittings for Galvanized Steel Piping: ASTM A 47, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
5. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.3 PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick.

1. Class 125, Cast-Iron Flat-Face Flanges: Full-face gaskets.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

2.4 LISTED FIRE-PROTECTION VALVES

A. General Requirements:

1. Valves shall be UL listed or FM approved.
2. Minimum Pressure Rating: 175 psig.

B. Double-Check Backflow-Prevention Assemblies:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Ames Fire & Waterworks.
b. Watts Industries, Inc.
c. Zurn Plumbing Products Group.
d. Approved equal.

2. Standard: ASSE 1015.
3. Operation: Continuous-pressure applications, unless otherwise indicated.
4. Pressure Loss: 5 psig maximum, through middle 1/3 of flow range.
5. Body: Cast iron with interior lining complying with AWWA C550 or that is FDA approved for NPS 2-1/2 and larger.
6. End Connections: Flanged for NPS 2-1/2 and larger.
7. Configuration: Designed for horizontal or vertical, straight through flow.
8. Accessories:

a. Valves: Outside screw and yoke gate-type with flanged ends on inlet and outlet of NPS 2-1/2 and larger.

C. Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Crane Company.
b. Milwaukee Valve Company.
c. NIBCO INC.
d. Approved equal.

2. Standard: UL 312.
3. Pressure Rating: 250 psig minimum.
4. Type: Swing check.
5. Body Material: Cast iron.
6. End Connections: Flanged or grooved.

D. Bronze OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Crane Company.
    b. Milwaukee Valve Company.
    c. NIBCO INC.
    d. Approved equal.

2. Standard: UL 262.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Bronze.
5. End Connections: Threaded.

E. Iron OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Crane Company.
    b. Milwaukee Valve Company.
    c. NIBCO INC.
    d. Approved equal.

2. Standard: UL 262.
3. Pressure Rating: 250 psig minimum.
4. Body Material: Cast or ductile iron.
5. End Connections: Flanged or grooved.

F. Indicating-Type Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Crane Company.
    b. Milwaukee Valve Company.
    c. NIBCO INC.
    d. Approved equal.

2. Standard: UL 1091.
3. Pressure Rating: 175 psig minimum.

4. Valves NPS 2 and Smaller:

    a. Valve Type: Ball or butterfly.
    b. Body Material: Bronze.
    c. End Connections: Threaded.

5. Valves NPS 2-1/2 and Larger:

    a. Valve Type: Butterfly.
    b. Body Material: Cast or ductile iron.
    c. End Connections: Flanged or grooved.

2.5 TRIM AND DRAIN VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.
3. Body Material: Bronze.
4. Size: Same as connected piping.
5. End Connections: Threaded.

B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Crane Company.
   b. Milwaukee Valve Company.
   c. NIBCO INC.
   d. Approved equal.

2.6 SPECIALTY VALVES AND EQUIPMENT

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Minimum Pressure Rating: 175 psig.
3. Size: Same as connected piping.

B. Automatic (Ball Drip) Drain Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Reliable Automatic Sprinkler Co., Inc.
   b. Tyco Fire & Building Products LP.
   c. Viking Corporation.
   d. Approved equal.

2. Standard: UL 1726.
3. Body Material: Bronze.
4. Type: Automatic draining, ball check.
5. Size: NPS 3/4.
6. End Connections: Threaded.

2.7 SPRINKLER SPECIALTY PIPE FITTINGS

A. General Requirements for Sprinkler System Fittings: UL listed or FMG approved for fire suppression service.

B. Branch Outlet Fittings: